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Virtuoso Reality
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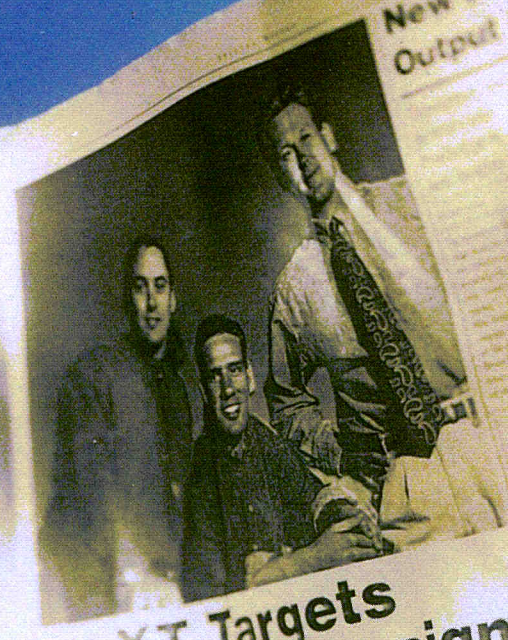
Come True

At Last: NeXT Publishing Arrives



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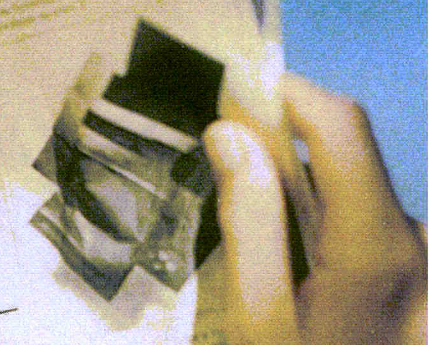

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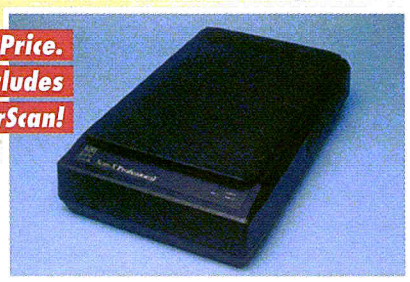

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NeXTWORLD

Winter 1992, Volume 2, Issue 4

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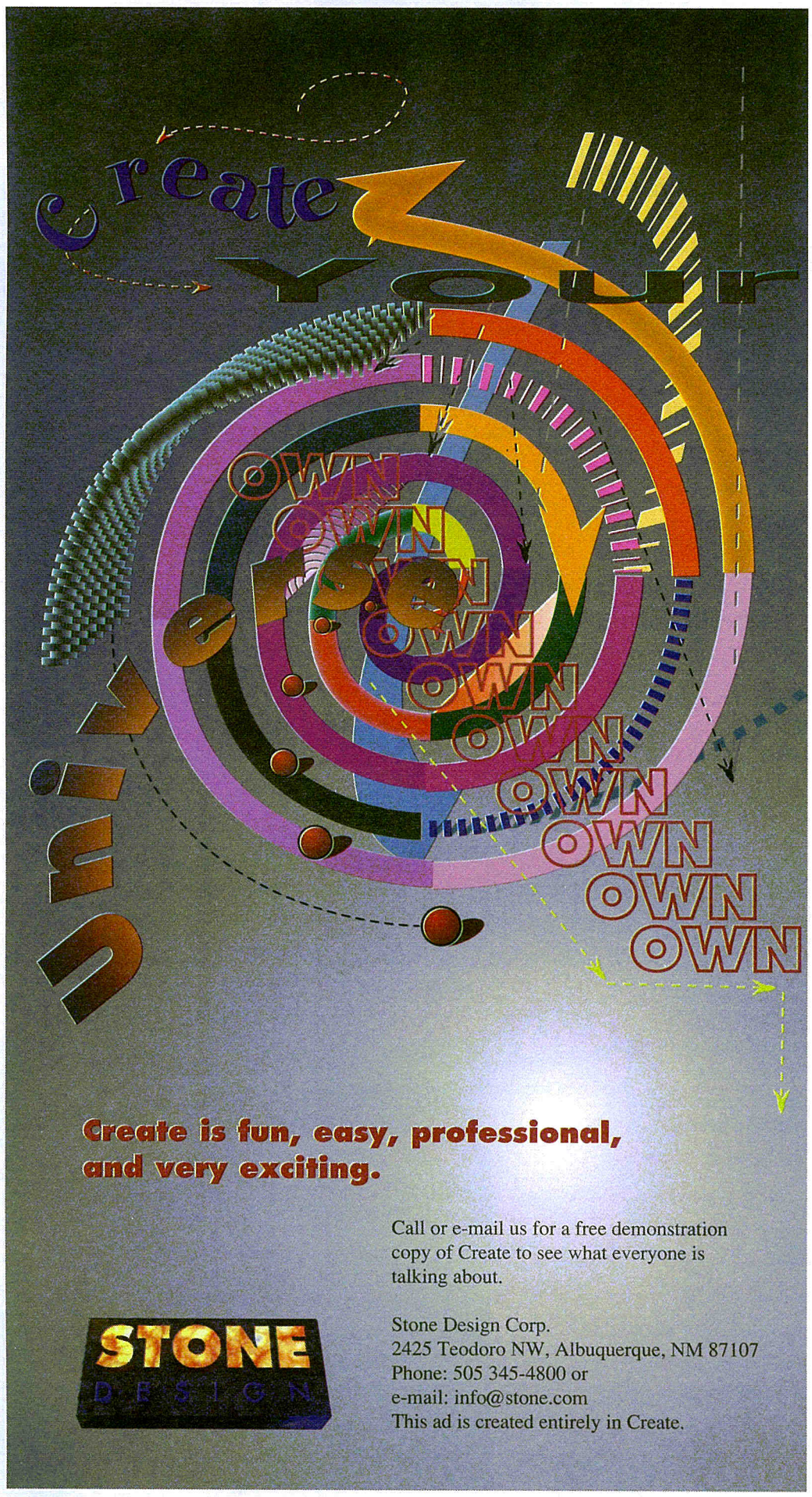

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Dave LaDuke, who then was
responsible for NeXT's publish

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The question has been: Is
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TWORLD

2, No. 4 *WINTER 1992*

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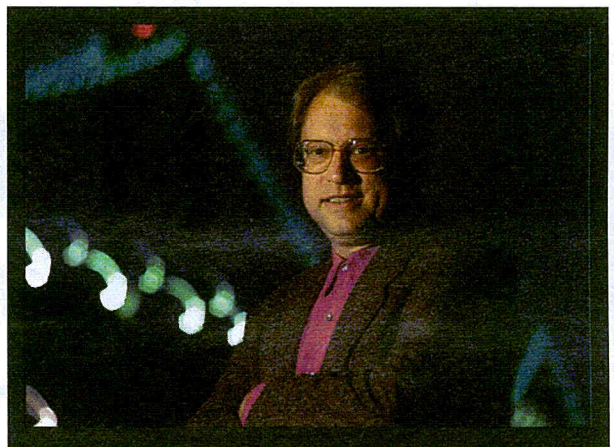
Everyone has a past, right? The skeleton in my closet is a Macintosh. Actually, it's still rattling around my house, and there's another on the corner of my desk at work. Neither gets much use these days.

For other NeXT users, the skeleton may be a PC or a Sun or something else. Most of us still have the odd application or two that sends us back to the past. The main one for me has been page layout, but now with the new software detailed in our Special Report on NeXT Publishing in this issue, I may be able to close my closet door for good.

The arrival of programs such as PasteUp, Virtuoso, Pages by Pages, and Image fulfills a promise NeXT made way back in 1988. They provide better, but basically equivalent, function to publishing solutions on Macintosh or Windows. The future arrival of programs built around the Archetype Document Engine and NeXT's modular-application strategy will offer a whole new promise that goes beyond any other platform.



Dry Bones

DAN RUBY

We all remember our first exposure to NeXT. Beyond being a curiosity seeker at the original NeXT rollout, my first time was when we had an early Cube on evaluation at the magazine I then worked for. It was delivered by Dave LaDuke, who then was – and still is – responsible for NeXT's publishing message.

He talked a lot about Display PostScript, the NeXT Laser Printer, and FrameMaker. He had little to show in illustration software, nothing for image processing, and barely existent support for scanners and imagesetters. We saw a lot of interesting demos, but almost nothing that was usable for real publishing work.

We took graphic arts and desktop publishing very seriously at this magazine. The trouble was, NeXT didn't seriously offer a solution we could recommend. NeXT recognized that fairly quickly as well, and publishing was soon replaced by interpersonal computing as the main reason to buy a NeXT computer. But NeXT's graphics technology didn't go away. Developers bided their time and worked on filling in the holes in NeXT's suite of publishing software.

Now we're harvesting the fruit, and it looks as good as Dave LaDuke promised back then. The contribution of the NeXTSTEP environment to the standard set of publishing-software tools is immense. Tasks that are drudgery on Macs or Windows are a pleasure on the NeXT: Rather than waiting 30 seconds for an image to redraw, color windows glide around the screen without a hitch. Instead of typing numbers in modal boxes, you reach right into your page and work directly on the elements. Your mind is freed of the details of the process and can focus on the result. You work faster and more intuitively.

To top it off, NeXT's prices compare favorably to a similarly configured Macintosh Quadra, especially if you include a comparison of color output. It's like the old Broadway hit: Anything Mac can do NeXT can do better, NeXT can do anything better than Mac.

The question has been: Is that enough? Will graphic artists and desktop publishers be enticed by NeXT's charms to replace their Macintosh and Windows systems? Certainly some graphic-design firms will choose to junk their Macs, but it's hard to imagine that a vast number will. Steve Jobs often says that NeXT can't just be better than a competitive platform; it has to be five or ten times better. Well, NeXT is qualitatively better than other systems for publishing, but the key word is qualitative.

Happily for NeXT, the Mac's graphic-arts market is not the only niche for publishing systems, nor is it the largest or easiest to cultivate. The bigger opportunity lies in corporate publishing – technical documentation, internal communications, presentations, and corporate identity. The users are the same type of buyer NeXT targets with its custom-apps message: large companies in a few big vertical markets.

For these types of users and applications, NeXT does offer order-of-magnitude advantages and a compelling reason to buy. They need the same customization for their publishing environments that they now have for their financial analysis or document-management systems. They need workgroup solutions that are tailored to the particular needs of their organization. Their software needs to be modular and extensible.

That's where the NeXT Publishing Environment (NPE) and the Archetype Document Engine enter the picture. NPE is a description of a future object market for publishing that would allow VARs, integrators, and users to mix and match components to fit any requirement.

NPE is a dream – and it is about as real as Dave LaDuke's dream in 1989. Like then, pieces of it are beginning to come together. But the products are not yet here that would permit users – as Archetype proposes – to work simultaneously in a document from multiple applications and platforms.

Unfortunately, NPE became a political hot potato as developers of shrinkwrapped packages protested NeXT's seeming endorsement of the Archetype engine. The issue came down to a shoot-out between modular and shrinkwrapped apps (see the "Point/Counterpoint" debate in this issue).

Of course, it shouldn't be a matter of one versus the other. The truth is that NeXT needs both great shrinkwrapped apps and a great object strategy, especially since the first is here now and the second is a year or more distant. NeXT should work hard to sell what it has today, and it should also forge ahead with technical and market development for NPE.

The beneficiaries are users like me, who can finally provide a decent burial for those rattling old bones from our past.

★ ★ ★

Now that we have the tools, designers and publishers can start to strut their stuff. If you're doing something interesting in NeXT-generated design, we'd like to know about it. Therefore, we're putting together a design contest with awards of hardware and software for the winners. We'll have categories for such applications as advertising and packaging, newsletters, corporate identity, technical pubs, and presentations. Start collecting your best work now. We'll have contest details in the next issue.

DAN RUBY *is editor in chief of* NeXTWORLD.

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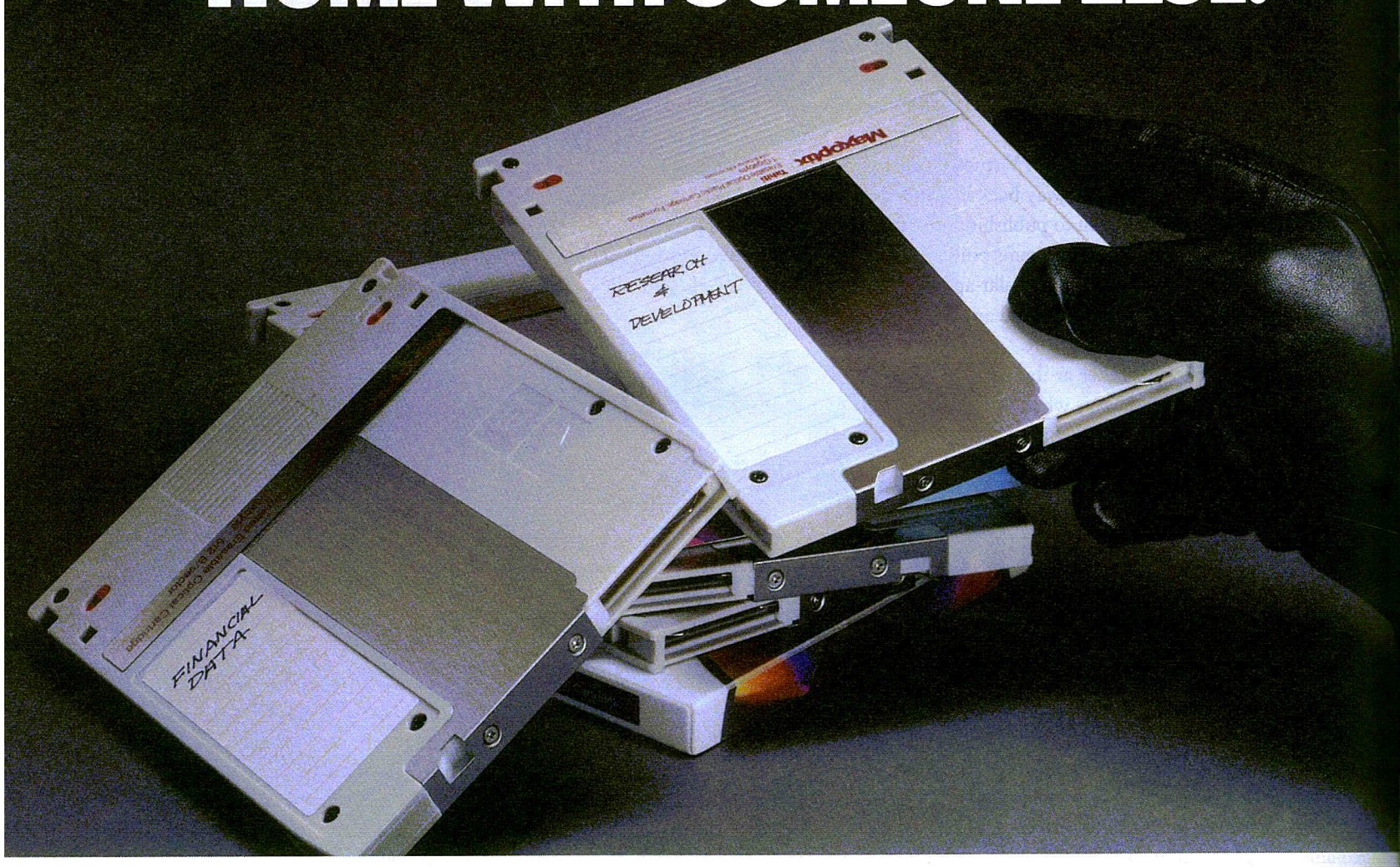

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More help

In your otherwise helpful Spec Report ("Help!") you neglecte mention two of the best source detailed NeXT information. N produces NeXTanswers, an ex sive collection of answers to co mon questions about software hardware, system administrati and programming. A service c FAQ (frequently asked questic which is not maintained by Ne discusses third-party informati more frankly. Both are availab from Internet archives; FAQ is posted regularly to comp.sys.n announce.

ALEX BLAKEMORE
Reston, Virginia

Mixed semaphores

What are those guys on the co of the latest *NeXTWORLD* (I 1992) spelling? My guess is th either HEEP or HLLP.

CHRISTOPHER NAGEL
Philadelphia

A quick search of Webster unc "semaphore" reveals that the is a poor representation of – gu what – "NeXT." The semaph in the "Help!" section inside N *WORLD* are a good represent of "Special Report."

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ART ISBELL
Santa Cruz, California

We were trying for "NeXT," though we have to agree the " was a bit shaky. If you think t lost at sea, take another look Beatles' original. – NW

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More help

In your otherwise helpful Special Report ("Help!") you neglected to mention two of the best sources for detailed NeXT information. NeXT produces NeXTanswers, an extensive collection of answers to common questions about software, hardware, system administration, and programming. A service called FAQ (frequently asked questions), which is not maintained by NeXT, discusses third-party information more frankly. Both are available from Internet archives; FAQ is also posted regularly to comp.sys.next.announce.

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JESPER LUNDH
Xanthus International, Sweden

Lifting the fog

Simson Garfinkel's article on ISDN ("ISDN Comes of Age," *NeXTWORLD*, Summer 1992) was simply the best article you have published so far. It was packed with facts about ISDN that I had trouble getting from any other source. Instead of making things religious, Simson showed he knew what he was talking about.

JERROD CARTER
Indianapolis, Indiana

PaperSight oversight?

In the review of ElectroFile in the Fall issue of *NeXTWORLD*, Dan Ruby says PaperSight is a tool that needs to be modified for each customer site. This could not be any farther from the truth. While a handful of customers take advantage of our ability to add special features, a vast majority (over 95 percent) of our sales are of shrinkwrapped software with scanners.

RICHARD V. NASH
Visual Understanding Systems
Pittsburgh

How-not-to

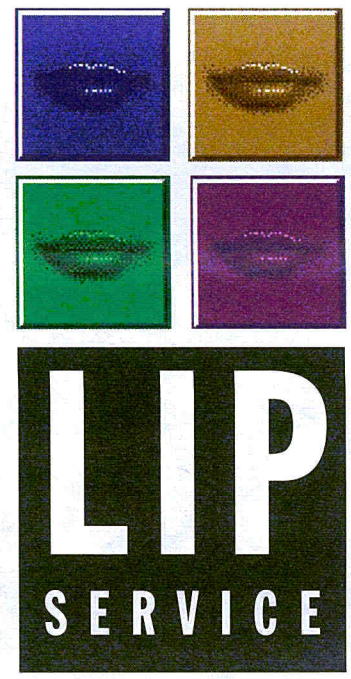
There's a pretty serious flaw in the "SysAdmin Hints and Tips" article from the Fall 1992 issue. Reaching the ROM monitor in the manner described will result in a dirty shutdown, potentially corrupting the filesystem and the NetInfo databases.

Rather than going to the ROM monitor, what about using the UNIX shutdown(8) command? It takes you down to single-user mode very nicely, without corrupting anything. If you insist on going to the ROM monitor though the NMI monitor, please recommend that people press Command-Command-back quote (`) instead.

ALAN M. MARCUM
NeXT Technical Support

"Detecting and Handling a Break-in" (*NeXTWORLD*, Fall 1992) makes no mention at all of the Computer Emergency Response Team (CERT). This is a grave omission, as they are basically the "911" of computer crime. Any system administrator should have CERT's telephone number handy (412/268-7090) and should report all break-in attempts. CERT archives contain information on correcting three security vulnerabilities specific to the NeXT and three that affect most UNIX machines, including the NeXT.

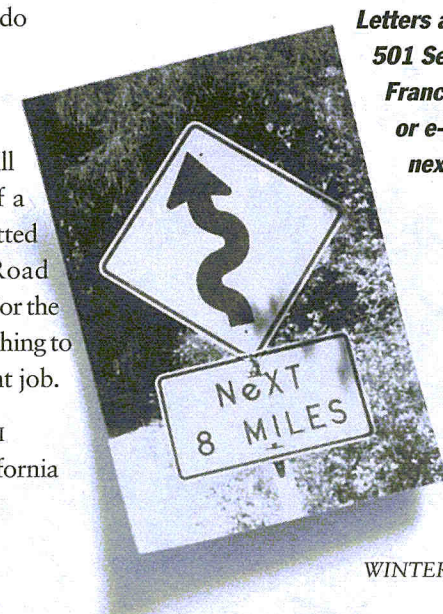
BARBARA J. DYKER
Boulder, Colorado



Vital signs

Enclosed you will find a picture of a road sign I spotted on Page Mill Road near Palo Alto. For the record: I had nothing to do with the paint job.

MARY A. BORDI
La Honda, California



Perot and con

Apparently you like Perot ("Rising Tide," *NeXTWORLD*, Fall 1992). I consider him a menace, with paranoiac tendencies, a predilection for paramilitary adventures, and a shaky grasp of the concept of civil liberty. As a subscriber, I hope your magazine will leave political commentary to *The Nation*, the *New Republic*, and the *National Review*, and concentrate on subjects in which it has technical expertise.

MICHAEL LARSEN
Philadelphia

For the record

- A graphic in the bound-in July issue of *NeXTWORLD Extra* (*NeXTWORLD*, Fall 1992) mistakenly stated that Matt Medeiros and Leo Hourvitz were removed from NeXT's policy team. In fact, both executives supported the team but were never actually members.
- The illustration of a Ferrari sports car in "Desktop Color" (*NeXTWORLD*, Fall 1992) should have credited the artist, Michael Bodily.
- On page 26 of *NeXTWORLD*'s Special Report in the Fall issue, the author of the book *The RenderMan Companion* should be listed as Steve Upstill. The publication date was 1989.

NeXTWORLD welcomes your comments. Please send them to Letters at NeXTWORLD, 501 Second St., San Francisco, CA 94107, or e-mail letters@nextworld.com.

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Circle 6 on reader service card

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ORIGINAL TOP TEN ARE OFFICIAL
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RANK	LAST QTR.	QTRS. ON LIST
1	2	4
2	6	4
3	3	6
4	7	2
5	8	3
6	1	4
7	4	3
8	5	4
9	U&C*	3
10	–	1

ITEM
OBJECT-MANAGEMENT STANDAR
GAMES
HIGH-PERFORMANCE SERVER
SILICON GRAPHICS ALLIANCE
LOW-COST ENTRY-LEVEL SYSTEM
TIME-BASED MEDIA STANDARD
END-USER RELATIONAL DATABAS
MULTIUSER PROJECT-MANAGEMI

ITEM
3-D MODELING PACKAGE**
CHOICE OF KEYBOARDS
PAGE-LAYOUT PROGRAM
BUILT-IN MIDI PORTS OR CARD
3-D GRAPHICS/ANIMATION
INEXPENSIVE COLOR PRINTER
NEXTWORLD EXPO
OS DISTRIBUTION VIA CD-ROM
NEXTSTEP PORT TO INTEL PC
NEXT SUPPORT FOR MAC FLOP
SERVICES FOR LINKING APPLICAT
HYPERTEXT AUTHORING SYSTEM
NEXT MARKETING MESSAGE

*On Up-and-Coming list last quarter
**Announced but not shipping

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TEN MOST WANTED

THE BIG CHANGE IS THE LOSS OF ALL THOSE IN THE BAG ASTERISKS. WITH 3.0 SHIPPING, MOST OF OUR ORIGINAL TOP TEN ARE OFFICIALLY RETIRED. NEWLY BAGGED ITEMS ARE 3-D MODELERS (NPOINT, 3DMAN, AND OTHERS IN THE WORKS) AND KEYBOARD CHOICE (WHICH DISAPPEARED IN GRAND STYLE WITH NEXT'S NEW ADB INPUT DEVICES). AMONG THE FASTEST RISERS ARE PERFORMANCE WORKSTATIONS AND SERVERS. READERS ARE LOOKING FOR NEW LUSTER ON THE HARDWARE SIDE OF THE BUSINESS.

RANK	LAST QTR.	QTRS. ON LIST	ITEM	COMMENT
1	2	4	NEXTSTEP NOTEBOOK	Your choice of Intel boxes
2	6	4	$99/MIPS WORKSTATION	Hello, hardware division
3	3	6	FULL-FEATURED CAD SOFTWARE	Positive trends in Europe
4	7	2	NEXT MANAGEMENT STABILITY	Key spots still not filled
5	8	3	WORKABLE SUPPORT MECHANISM	Developer pricing scheme troublesome
6	1	4	MPEG COMPRESSION	Less reader mail this time
7	4	3	EXPANDED MARKETING MESSAGE	Grand Unification Theory
8	5	4	OD SURVIVAL	Society for Creative Anachronism
9	U&C*	3	SPARCSTATION PORT	Readers' choice
10	–	1	1993 EXPO INFORMATION	Stay tuned

UP-AND-COMING

ITEM	COMMENT
OBJECT-MANAGEMENT STANDARD	ODI deal intriguing
GAMES	Getting bored around the office
HIGH-PERFORMANCE SERVER	Agnosticism isn't enough
SILICON GRAPHICS ALLIANCE	Natural partners
LOW-COST ENTRY-LEVEL SYSTEM	Not just a cheap '486
TIME-BASED MEDIA STANDARD	Show Apple how
END-USER RELATIONAL DATABASE	Not everyone is client-server capable
MULTIUSER PROJECT-MANAGEMENT SOFTWARE	Still AWOL

IN THE BAG

ITEM	DATE REMOVED	COMMENT
3-D MODELING PACKAGE**	Sept. 1992	Spate of enhancers
CHOICE OF KEYBOARDS	Sept. 1992	New board and mouse should quiet dissent
PAGE-LAYOUT PROGRAM	July 1992	The wait pays off
BUILT-IN MIDI PORTS OR CARD	May 1992	MIDI Link from Quest
3-D GRAPHICS/ANIMATION	Jan. 1992	3DKit in NeXTSTEP 3.0
INEXPENSIVE COLOR PRINTER	Jan. 1992	NCP, anyone?
NEXTWORLD EXPO	Jan. 1992	First of many
OS DISTRIBUTION VIA CD-ROM	Jan. 1992	Get your drive
NEXTSTEP PORT TO INTEL PCS **	Jan. 1992	Looking like Q1 '93
NEXT SUPPORT FOR MAC FLOPPIES	Jan. 1992	NeXTSTEP 3.0
SERVICES FOR LINKING APPLICATIONS	Jan. 1992	3.0's Object Links
HYPERTEXT AUTHORING SYSTEM	Jan. 1992	Good start in CraftMan
NEXT MARKETING MESSAGE	Nov. 1991	Custom apps

*On Up-and-Coming list last quarter
**Announced but not shipping

STREET PRICES

These are the best prices we could find, as of press time, on in-demand NeXT products. You should be able to match these prices with a little shopping.

HARDWARE

PRODUCT	BEST PRICE	WHERE
FULL-HEIGHT 5.25-INCH INTERNAL DRIVE – 660 FUJITSU	$1160	Fast Access, 708/530-7749
1.2GB INTERNAL DRIVE – 1.2 FUJITSU	$1705	Fast Access, 708/530-7749
1.44MB FLOPPIES (SONY)	$11/10	Computer Attic, 415/322-0639
2.88MB FLOPPIES (TOSHIBA)	$55/10	NeXTConnection, 800/800-6398
4MB SIMM (MONOCHROME)	$102	Memory Plus, 800/388-7587
4MB SIMM (COLOR)	$106	Third Wave, 800/284-0486

SOFTWARE

PRODUCT	LIST	STREET
DRAW (Appsoft)	$399	$299
TOUCHTYPE (Adobe Systems)	$249	$175
DIAGRAM (Lighthouse Design)	$499	$339
METROTOOLS (Metrosoft)	$129	$ 99
SOFTPC (Insignia Solutions)	$499	$329

PRESS CLIPS

The world doesn't have very many computer companies left that are defining platforms; really trying to figure out how people want to use computers and defining a platform of software and hardware to provide that. Silicon Graphics is one of them that are still doing that, and I admire the fact that Steve Jobs is also doing that. So many companies today are just copying what other companies do, and cloning them. It's nice to see a company that's willing to do the hard work of really defining how people are going to use computers and trying to design a platform that fits their needs.

SILICON GRAPHICS PRESIDENT AND CEO ED MCCRACKEN, *MICROTIMES*, JULY 6

The word "open" has been bandied about so much I don't know what you mean by it. Does it mean that the source code is in the public domain? We're not open. Does it mean that anyone can write software for it? Then we are open. Does it mean that it runs on more than one hardware platform by more than one vendor? Then the day we ship NeXTSTEP 486, we'll be open.

STEVE JOBS, *UNIFORUM MONTHLY*, MAY 1992

Object World '92 was a bitchy event from the start. Unfortunately, Jim Allchin is not the most charismatic senior executive that Microsoft could have fielded. Under attack from all the panelists and with a hostile audience, Allchin admitted that Microsoft would be slower in the innovation stakes than its competitors when it came to object technology. Later, he tried to get revenge by responding that if fairy tales were true Steve Jobs's nose would have grown. He had misjudged the audience, which, sitting rapt in Jobs's hands, greeted this comment with boos and hisses. The concluding score? Jobs and the Object Management Group 1, Microsoft 0. We await the rematch with interest.

COMPUTERGRAM INTERNATIONAL, AUGUST 4

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BOSS LOGIC INCORPORATED

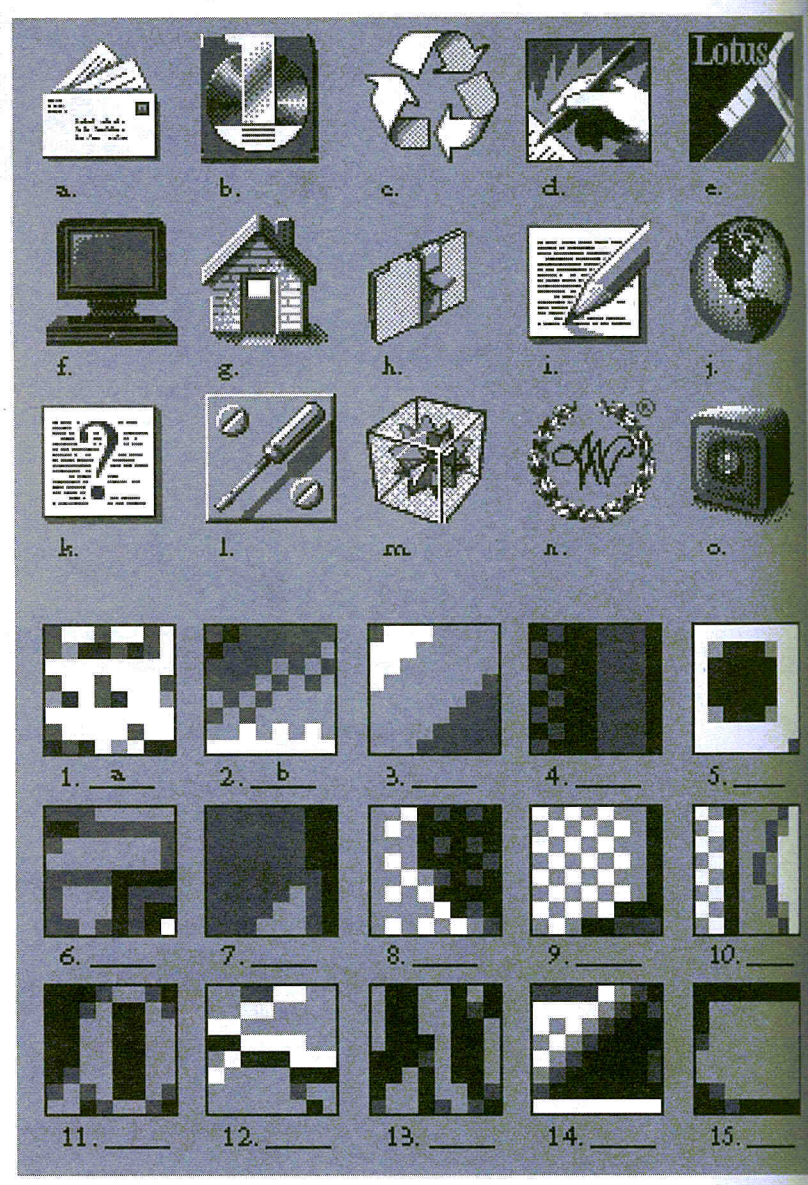
NeXT Games

By Scott Kim

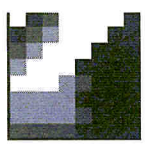
Icon designers are masters of detail. Here are 15 familiar icons; all except the Lotus Improv icon were designed by former NeXT interface designer Keith Ohlfs. Each icon was drawn in 48 by 48 pixels with just four colors: black, white, light gray, and dark gray. (In NeXTSTEP 3.0, icons can have colors as well as shades of gray.)

Look carefully and you'll see a suprising amount of subtlety in these icons. The details often become unrecognizable when you look at them close up. For instance, the address on the envelope in icon 1 turns out to be the speckled pattern in close-up *a*.

Each of the remaining close-ups matches part of one of the icons. No two close-ups match the same icon. All close-ups are right-side up and enlarged by a factor of 600 percent. Can you match each close-up with its icon?



CONTEST The close-up below matches part of the icon for a common NeXT application not shown on this page. Can you name the application? Up to ten lucky winners will receive a *NeXTWORLD* T-shirt. Address entries to Puzzle Editor, *NeXTWORLD*, 501 Second St., San Francisco CA 94107. Or fax us at 415/978-3196. And while you're at it, write us a note about the magazine. Entries must be received by October 30, 1992.



Application:_____

Your name and address: _____

_____

The number of winning guesses for the Summer 1992 NeXTGame – 40 – nearly broke *NeXTWORLD*'s T-shirt budget. The answer was: (N in T) over (X in E). The tricky part for many respondents was distinguishing the difference between (A in B) and (B in A) – the resulting shapes are the same, but the color of the composite always matches the color of the first letter.

New in Shrink Wrap

July 1 to October 1

Connectivity, Communications, and Emulation

NXFax
Driver for ZyXEL fax/data modems
B&W Software
802/496-5113

Soft•Switch SMTP Gateway
Multiprotocol e-mail connectivity
Soft•Switch
215/640-9600

SLAT-2
Provides four parallel ports and/or up to 32 asynchronous serial ports per SCSI address
Uninet
714/263-4222

Database and Information Management

afs:TRADE
Complete suite of financial-trading objects
Anderson Financial Systems
215/653-0911

IDB Object Database
Distributed-object database
Persistent Data Systems
412/963-1843

Lotus Real-time Engine / Lotus Real-time API Tool Kit
Connectivity to real-time financial data
Black Diamond Technologies
312/554-5131

Vertex Librarian
Improved Digital Librarian
Vertex
412/931-7600

Science and Engineering

SpinDoctor 1.1
Visualization of experimental data
Impact Software
212/686-3512, 800/822-3385

PhaseScope 2.0
Qualitative analysis of the stability characteristics of dynamic systems
Impact Software
212/686-3512, 800/822-3385

VISA
Translates DXF files to PostScript
Graphisoft
415/737-8665

Publishing and Graphics

EquationBuilder
Mathematical-equation typesetting software
Digital Tool Works
617/742-4057

Virtuoso
Single-page illustration and layout program
Altsys
214/680-2060

Tools and Languages

DisplayTalk
Display PostScript development environment
Adobe Systems
415/961-4400, 800/344-8335

Gdb 2.1
GNU debugger front end
Impact Software
212/686-3512, 800/822-3385

Photo-realistic RenderMan
Language for describing 3-D scenes
Pixar
510/236-4000, 800/937-3179

CD Studio
Complete desktop write-once disc system
Young Minds
714/335-1350

Utilities

SBook
Personal information manager
Simson Garfinkel and Associates
617/354-7888

WorldClock
Multiple clocks with alarms
Information Technology Solutions
800/394-4487, 312/951-7462

SafetyNet Personal / SafetyNet Pro
Improved GNU-based archiving
Systemix Software
410/290-8813

BackupMaster
Incremental backup software
Teledia
412/321-5850

Answers:
1. n 2. b 3. i 4. o
5. k 6. g 7. l 8. j
9. h 10. c 11. e 12. m
13. n 14. d 15. f

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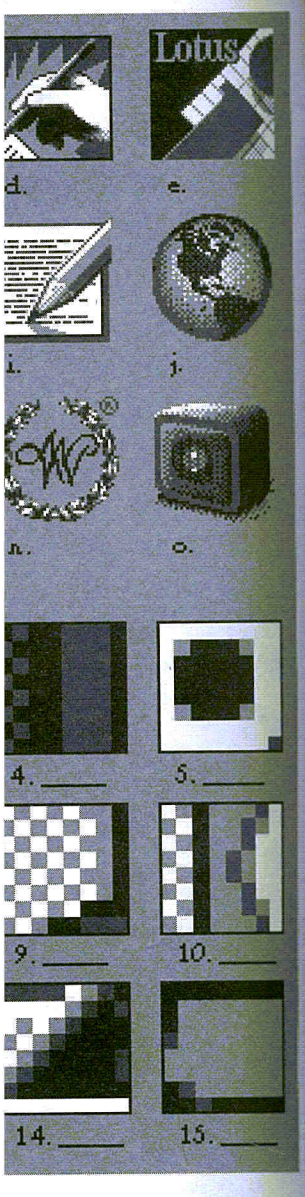

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Personal information manager
Simson Garfinkel and Associates
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Information Technology Solutions
800/394-4487, 312/951-7462

SAFETYNET PERSONAL / SAFETYNET PRO
Improved GNU-based archiving
Systemix Software
410/290-8813

BACKUPMASTER
Incremental backup software
Teledia
412/321-5850

Answers:
1.a 2.b 3.i 4.o
5.k 6.g 7.l 8.j
9.h 10.c 11.e 12.m
13.n 14.d 15.f

~~2.0~~ ~~2.1~~ 2.2 2.3 2.4 . . .

Year-end 1991

Mid-year 1992

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Circle 58 on reader service card

Lone Wolf

Boats are playing on the breezy Charles River this late June Boston morning, but in the Allston walk-up office of Athena Design, there are no lazy, hazy days of summer.

After seven months of intense development, Athena is set to ship the final beta of Mesa, "a traditional spreadsheet that lives perfectly in the NeXT world," according to president David Pollak. If all goes well, Mesa will be ready to ship to customers by mid-August.

There is no time to relax. Several months ago, Pollak was negotiating to license Mesa to Appsoft. The deal fell through, however, and now Appsoft has instead acquired rights to the one program that could compete with Mesa, the long-dormant PowerStep. Both Mesa and PowerStep, which Appsoft has said it will repackage as Appsoft Solution, are native NeXTSTEP programs that are fully compatible with Lotus 1-2-3, a niche currently unfilled by Informix's Wingz (a Macintosh port) and Lotus Improv (a one-of-a-kind financial modeler).

It is somewhat unusual for a NeXTSTEP software category to experience such a heated fight for market share. And Pollak knows that without the substantial marketing resources of an Appsoft, Lotus, or Informix, his best chance is to get Mesa to market quickly.

Despite the seeming great odds, the 28-year-old Pollak exudes a quiet confidence. With 14 years of professional programming experience and a law degree already behind him, Pollak has gambled his life savings on Mesa. "If it fails, I can always put on a suit and go back to lawyering or else put in 60-hour weeks custom programming. But this feels right, it feels good," Pollak says.

Athena Design's **David Pollak** *decided to market his 1-2-3–compatible spreadsheet, Mesa, on his own after a deal with Appsoft broke down.*

Pollak began commercial development work as a teenager. He developed a system for the Federal Emergency Management Agency in which Apple IIs served as character generators for a civil-defense system. He also worked on Commodore 64 database products for Spinnaker Software. In 1984, he won an award for a set of Commodore utilities.

After graduating from Rhode Island College, he worked briefly in business and then went on to law school at Boston University. Later, he interned for a Boston law firm specializing in high-technology law and passed the Rhode Island bar.

While he enjoyed the challenge of the law, Pollak found that programming better suited his personal style. In the summer of 1989, he discovered UNIX and object-oriented programming. His interest in NeXT soon led him to Developer Camp and the NeXT chapter of the Boston Computer Society, whose presidency he briefly assumed.

In order to get a better feel for the workings of the NeXT market, Pollak wrote and shipped a commercial game package, Culture Shock, in March 1991. "It took all of a day to write," says Pollak. Still, its clever use of sound in a Shanghai tile game attracted fans, many of whom passed it around illegally from machine to machine.

Now Pollak was ready for a substantial product on which he could make some money. He started work on Mesa in the fall of 1991. A few weeks later he met some developers at a NeXT seminar in Washington, and word of his project was soon out. Expecting to need help with marketing and distribution, he talked with virtually every publisher in the NeXT market. If there was to be a deal to license the program, the most likely partner was Appsoft, which had the funding and the business plan to publish and aggressively market a NeXT spreadsheet program.

Talks between Pollak and Appsoft executives Randy Adams and Peter Karnig did not go well, however, and Pollak eventually turned down the contract that was offered. "It wasn't a matter of money, but of attitude. I was disappointed with the way they treated the relationship," Pollak says.

Instead of a partner, Pollak gained a competitor. He claims Mesa is faster, has a cleaner user interface, and has a lead of six months in getting to market. On the other hand, he acknowledges that PowerStep has a more sophisticated macro language, a deficiency Pollak intends to correct in Mesa's second release.

"My biggest vulnerability is market perception," Pollak says. Can a small, independent company compete with the big boys? It is a question only time can answer. As the Boston summer entered the dog days, Pollak seemed to have time on his side.

by DAN RUBY

PHOTOGRAPH BY RAYMOND MEIE

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ever – NeXTSTEP '486 – his
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control. Of course these qual
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fact that Parkhurst lives in H
and only visits NeXT headqu
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his work requires it.

Parkhurst didn't always
such a long, sunny commute
was right down the road at I
Videotext in Mountain View
joining NeXT in 1986. Altho
Parkhurst was, in his own w
"NeXT's first non-Apple emp
he was quite familiar with M
(and particularly their faults)

Group D

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But Mahoney's list of NeXT-re
plishments goes beyond that.
college professor who uses
nology in his classes on com
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for defense-industry firms.

Mahoney, chairman of th

PHOTOGRAPH BY STUART WATSON

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Frequent Flyer

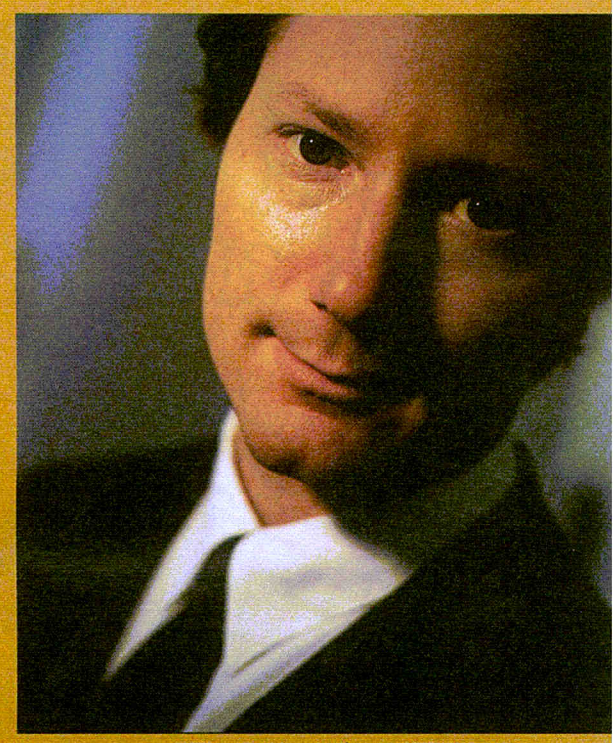
William Parkhurst doesn't seem to have much trouble with stress. As the team leader of what may prove to be NeXT's most important product ever – NeXTSTEP '486 – his hands are full, but his calm manner and constant tan suggest the essence of control. Of course these qualities may have something to do with the fact that Parkhurst lives in Hawaii, and only visits NeXT headquarters in Redwood City, California, when his work requires it.

Parkhurst didn't always have such a long, sunny commute. He was right down the road at Living Videotext in Mountain View before joining NeXT in 1986. Although Parkhurst was, in his own words, "NeXT's first non-Apple employee," he was quite familiar with Macs (and particularly their faults), having been founder of the first Macintosh developer association at Silicon Valley's Software Entrepreneurs' Forum.

"The Mac brought ease-of-use to users, but it did nothing for programmers," says Parkhurst, who had become "highly sensitized to programming environments" while writing the best-selling Macintosh application Click Art Effects. When he heard through the grapevine that Steve Jobs had started a new company, Parkhurst was immediately interested. "I thought maybe NeXT would give me the opportunity to do some things that I couldn't do on my own."

He thought right. When Parkhurst arrived, NeXT was about to license an existing toolbox that ran on top of UNIX System 5. Before committing to it, however, NeXT wanted to test it, so Parkhurst began porting its toolbox routines.

Early on in the project Parkhurst realized the system was "junk": "The programming model was even less friendly than the Mac's." He suggested a completely new development of the toolbox run-time environment, from the ground up. The result was a godsend for programmers. The AppKit he created is responsible for one of NeXT's greatest competitive advantages: faster application development.



William Parkhurst *pilots NeXTSTEP '486*

Photograph by Eric Millette

Not long after NeXT shipped its first NeXTSTEP release, Parkhurst decided to take a Hawaiian vacation. Before he departed, Jobs asked him to think about what NeXT should be doing over the next few years. Indeed, Hawaii made such an impression on Parkhurst that it allowed him to "think more deeply." After the trip and another meeting with Jobs, Parkhurst was a man with a new mission: "To make sure applications on our machine are really great." He left the software division and joined NeXT's developer partners group as the → PAGE 12

Group Dynamics

The year was 1979. The Sex Pistols were anarchists. The Ramones wanted to be sedated. The Clash were fighting the law (which won.) And Michael J. Mahoney was lead singer for The Groupoids, a raw but powerful Santa Barbara, California, band. "We were a very short-lived band. We did mostly covers," recollects Mahoney, who has since had greater success in another career: Music's loss turned out to be the NeXT community's gain.

SCAN man **Michael Mahoney**

Photograph by Stuart Watson

Thirteen years later, NeXT users in Southern California know Mahoney as the founder and president of SCAN – the Southern California NeXT Users Group. But Mahoney's list of NeXT-related accomplishments goes beyond that. He is also a college professor who uses NeXT technology in his classes on computer graphics and interface design, a writer who is coauthoring a book on NeXTSTEP programming, and a contract programmer for defense-industry firms.

Mahoney, chairman of the Computer Engineering and Science Department of the California State University at Long Beach, has been a user and fan of NeXT machines since the first Cubes came out. Like many, though, Mahoney came to computers indirectly. After initially receiving a Ph.D. in mathematics – his dissertation was on matrix theory – Mahoney took a job as a math professor at Cal State Long Beach. At the time, the school's computer science department was part of the math department.

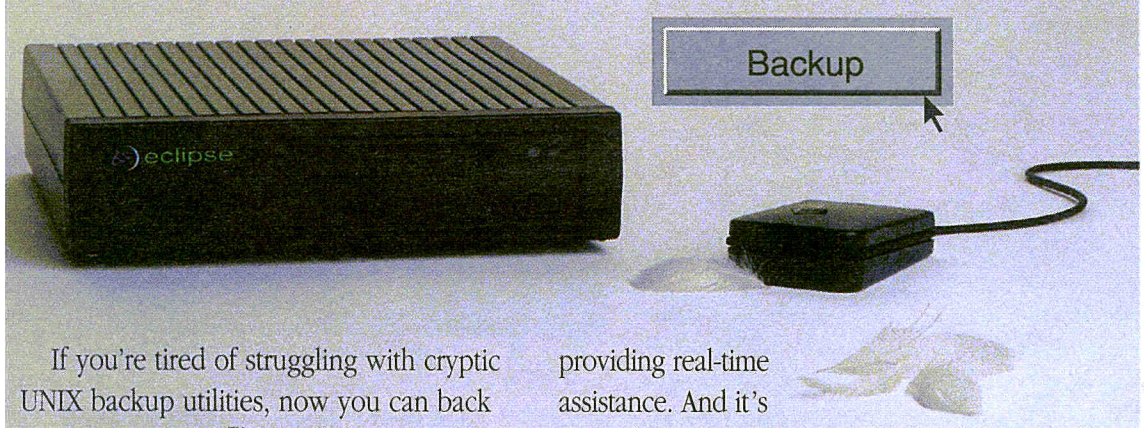
Mahoney's interest in computers was piqued in 1982. "I just found computers more interesting than mathematics – and also easier," he says. So when computer science formally broke out of the math department, Mahoney didn't waste time. "I always thought I'd be a math professor," says Mahoney, sounding a bit surprised himself at the turn in his academic career. "Now, I do only enough math to support the courses."

In the computer science department, Mahoney continued to teach himself how to program, concentrating on graphics and interface design. When the first NeXTcubes came out in 1989, he got one of the university's first ten. As soon as he started using the Cube, he was floored.

"It turned my life upside down," he says. "It was the object-oriented environment that really did it." Mahoney was particularly taken with Interface Builder, which he incorporated into his courses in graphics and interface design. Since then, several of his graduate students have written theses about NeXT programming.

Early on, Mahoney began convening informal user-group meetings between graduate students using NeXT machines and others looking for a dialogue about NeXT programming. Word about the → PAGE 12

Backup without getting TAR and feathered.



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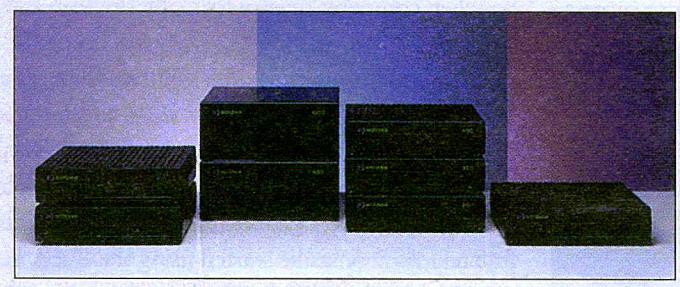

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Circle 2 on reader service card

→ **Frequent Flyer**

resident application-design guru.

The new job often put him on the road – or more specifically, in the air. In addition to the registered NeXT developers needing his help all over this country, Canon engineers working in Japan on the Kanji version of NeXTSTEP wanted use of Parkhurst's skills. As he regularly bounced between Redwood City and Japan, Parkhurst often stopped over in Hawaii for long weekends of sun and surfing. "I was living on a plane so much that it didn't really matter where I lived on the ground," he remembers. So he moved his home to Hawaii.

Parkhurst sees the latest change in his life as yet another improvement. In his role as jet-setter, he spends lots of time listening to developers, and they tell him this: If NeXTSTEP is to gain wide acceptance, it needs broader hardware support. So, since last August, he has managed the engineering of NeXTSTEP '486, which he calls "an important piece in the chain of events."

Looking back at his time with NeXT and at the oceans and states he's crisscrossed, Parkhurst is characteristically cool – and upbeat. At the very least, he points out, "it proves you can get a lot of business done using NeXTmail."

by JOE HUTSKO

→ **Group Dynamics**

meetings got out. "Back in September of 1990, we decided to open meetings to off-campus people," Mahoney says. "It just so happened our first meeting was a few days after the slabs were announced and we were lucky enough to get a demo."

Since the day SCAN opened to the public, it has grown to 250 members. Meanwhile, Mahoney has somehow found time – between his teaching (he was recently named a full professor at Cal State), his stewardship of SCAN, and his industry consulting – to collaborate with Simson Garfinkel on *NeXTSTEP Programming – STEP ONE: Object-Oriented Applications*, which is scheduled to be released this fall from Springer-Verlag.

"The book is kind of swamping me right now," he says. Of his job heading SCAN, Mahoney says: "It's great, although if you know someone who wants to take it over . . ."

Just for a moment, Mahoney sounds like he may be missing the easy, halcyon days of being a rock star.

by PAUL KARON

What's NeXT?

Keep up with the hottes computer market in the pages of NeXTWORLD The only magazine ded to NeXT computers.

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What's Next?

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NeXTWORLD

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PHOTOGRAPH BY VOLDI TANNER

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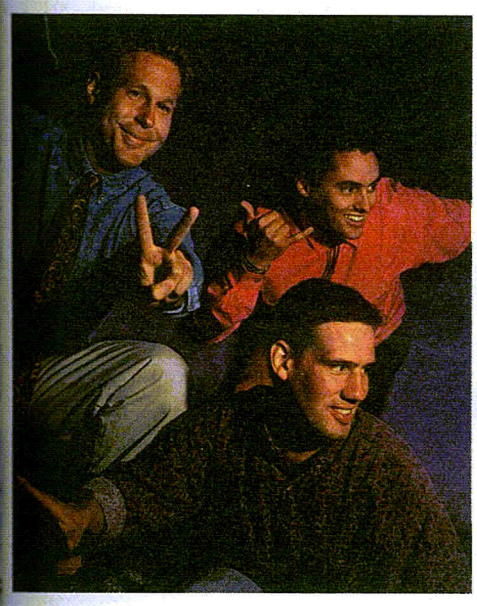
Three-part Harmony

The three young partners at Vivid Publishing, creators of TypeView software, credit accidents for both the formation of their company and the development of their NeXT product. It was not by mistake, however, that they ended up where they did: just north of Silicon Valley, sharing a live-and-work space that has a great view of the mountains.



Vivid Publishing: *Designing information*

"It's inspirational," suggests Nathan Shedroff, the group's designer and an area native. "It's without the industrial sprawl of the Valley," management and marketing man Sterling Hutto adds in a Georgia drawl, finishing his colleague's thought, as these three tend to do. "It fits our small-town upbringing," concludes Ken Fromm, the programmer in the group.

Their conversational style and their harmony about the location make it clear they get along. "Our skills balance out, our personalities mesh," says Shedroff.

The Vivid partners started out far afield of each other, however. Shedroff studied automobile and interface design and then worked on a unique information-design approach to books at The Understanding Business (TUB) in San Francisco; Hutto was trained in electrical engineering and physics, and then studied psychology and teaching; Fromm was on the board of the Bay Area NeXT Users Group and the principal author of Adobe's *Programming the Display PostScript System with NeXTSTEP*, which members of the NeXT community commonly refer to as "The Purple Book."

When the trio decided to create a book together, they had no idea it would mean setting up a whole company – or moving beyond traditional books to hypermedia and software. "Publishing books is a lot like publishing software," explains Shedroff. "We help people understand information, give them more access, awareness, and empowerment."

The development of TypeView as a NeXT product occurred in the process of building the font-access-and-choosing utility for internal use in their publishing business. It turned out they weren't the only ones in need of it. "Fonts are emotions in type," says Hutto, offering a rationale for providing graphic artists and nondesigners alike with help in managing and applying their font collections.

So far, Vivid has had several successes. Its first book design project, *Danny Goodman's Macintosh Handbook*, used a unique visual presentation that mimicked that platform's familiar iconic interface. Then came their own title, *Understanding Computers*, which reflected and advanced the innovative style Shedroff had developed at TUB while working with information-design guru Richard Wurman.

Like many book publishers, the Vivid partners haven't yet moved to using the NeXT themselves for desktop publishing; the company has produced all its books with PageMaker on the Macintosh. The team is anxious to switch, but won't do so until NeXT ships a notebook machine.

"We're not a platform-specific company," says Shedroff. "We're [developing] on the NeXT because of its capabilities."

Shedroff believes the concurrent imaging model of Display PostScript could make NeXT the electronic-publishing platform of choice in the near future. Meanwhile, Vivid has plans to put out a series of "Understanding" books, including one about CD-ROM, and software tied to information products such as Map View, a personal geographic-information system to access maps on the NeXT.

As long as it means learning something new. Says Hutto: "If we can't grow by doing it, we're not interested."

by STUART SILVERSTONE

PHOTOGRAPH BY VOLDI TANNER

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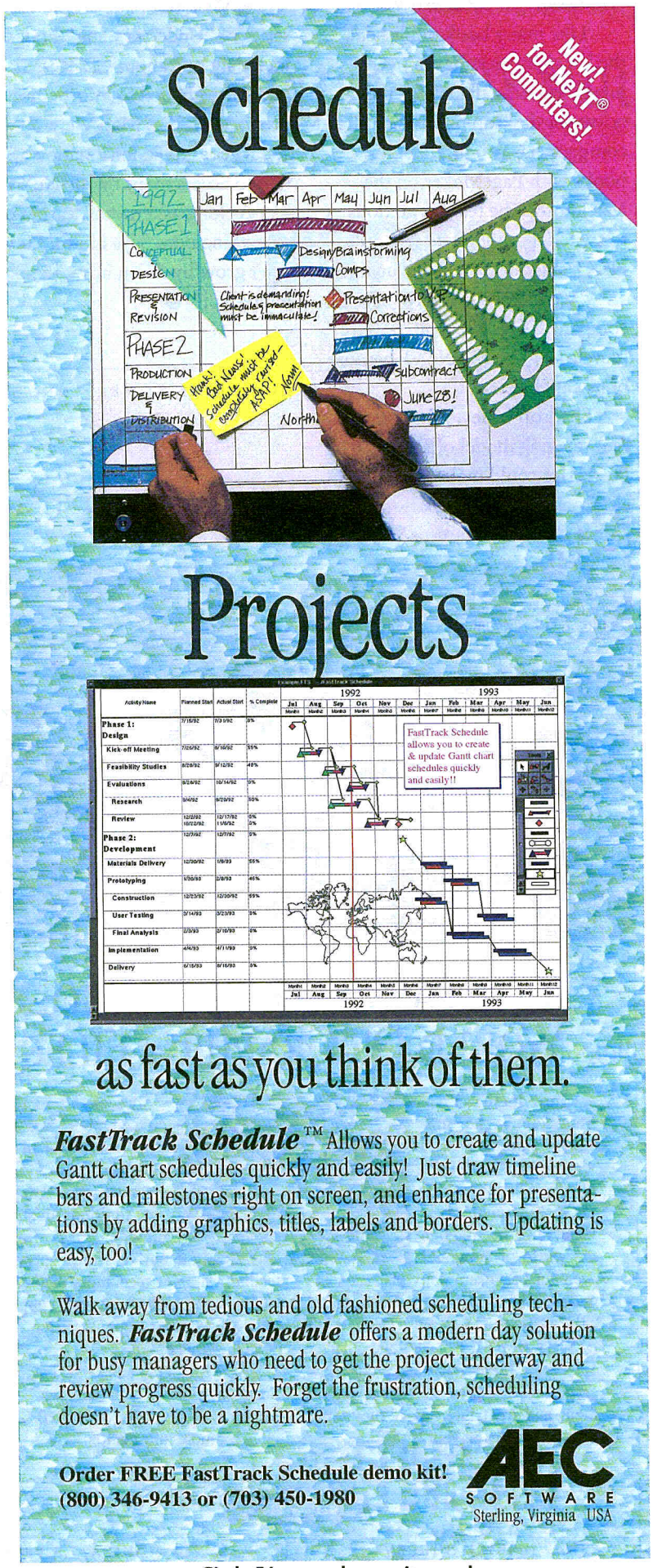

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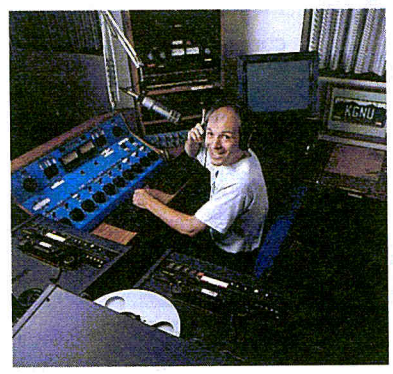
Air Play

Boulder in summer is a place where anything might happen. On a Sunday afternoon, the walk down Walnut Street towards KGNU is quintessentially Boulder: absentminded, open-minded, and queerly expectant.

The public radio station's basement studios, on the contrary, are buzzing with activity. It's five minutes to airtime for the cast and crew of "Actual Passion," KGNU's award-winning radio soap opera. Coffees are downed, microphones checked, and in the production room a mouse pointer hovers above the Play button on the screen of a NeXT computer.

"Actual Passion" is one of many KGNU projects in which the NeXT has supplanted the razor blade as a sound-editing tool. Utilizing Metaresearch's SoundWorks on a NeXTstation with a 2GB hard drive, the station's volunteer staff has found that the NeXT affords the instant integration and absolute ease-of-use that are key to live broadcasts.



KGNU *volunteer Davide Andrea*

"A one-to-two-minute sound compilation or news brief might take two hours to prepare using traditional methods," explains Davide Andrea, a longtime volunteer who donated the NeXTstation to KGNU last year. "On the NeXT it takes 45 minutes, and we're able to achieve a level of detail we wouldn't have even attempted before."

This is not to say that SoundWorks is ideal. "We have over 200 volunteers, of which maybe five percent are computer-literate," he explains. "With SoundWorks, if you want to edit a sound you are playing, you have to open another window and use a different set of controls. This is not user-friendly." KGNU needed a program that was simple to use yet more sophisticated than SoundWorks. So Andrea and a team of 11 volunteer programmers have taken advantage of the NeXTSTEP development tools and begun work on a custom editing program called RadioPlay.

But writing software, even on the NeXT, can be a painfully slow process when development time is entirely donated. "It's a rotating cycle of unemployment," says Joe Pezzillo, director of "Actual Passion."

Despite these difficulties, the RadioPlay development project has been quite successful. "Every time there's a volunteer turnover I have to run a little Developer Camp," says Andrea, who attended NeXT's Developer Camp himself last year. "I've got it so that in the equivalent of about 12 hours, these people are programming on the NeXT."

While KGNU could have met production goals on the Macintosh using Digidesign's Pro Tools, the Mac system was priced $10,000 over the NeXT. Even then, however, Pro Tools couldn't meet the ease-of-use standards. "The NeXT is to the Mac what the Mac is to the IBM in terms of user interface," says Andrea.

That this kind of hands-on innovation is a daily reality in community radio may come as a surprise. But then, this is Boulder. This is Colorado. And this is NeXT.

by LEANN COULTER

PHOTOGRAPH BY RUSSELL MCDOUGAL

Field Reports

Hot topics and goings-o the NeXT user commu

Threads from the Ne

Who's supporting whom? Hov protest were heard from bot porate and commercial deve about NeXT's new develope port policies, under which f range from $225 for a singl tion to many thousands of d for a year of asking questio Though several posters note other manufacturers with la installed bases had worse su most agreed the prices seem high, especially since NeXT has often been known to an questions incorrectly. One p wrote in humorous exasper that "$225 a question woul so bad, if only they would p $225 for every incorrect an Others suggested that only questions should be charge large fee (to discourage ove the support lines), while mo cult ones (involving bugs N needs to know about, for e should be free. Many worri about how bug reporting w under the new system.

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PHOTOGRAPH BY RUSSELL MCDOUGAL

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★

Net strikes back. In a more practical vein, developers discussed forming ad-hoc groups for the expressed purpose of pooling individual questions under a single expensive support contract, while others noted that traffic in both the dev-next and next-prog mailing lists and the comp.sys.next.programmer newsgroup will certainly skyrocket, taking up some of the slack.

★

Silicon dreams. In a wonderful example of stream-of-net-consciousness, a long thread in the advocacy group began as a heartfelt plea for Silicon Graphics and NeXT to talk about swapping technology, took a turn to a discussion of SGI's IRIX vs. NeXTSTEP, then digressed into comparisons of various RISC chips, veered into NeXTSTEP '486 and marketing strategy, and ended with "X11 must die!" The original premise may not be so far-fetched, now that the SGI GL graphics library is being ported to i860s.

★

Meta-open. As NeXT continues to announce "open system" moves, such as the licensing of their NetInfo source code to other machines and POSIX compliance for NeXTSTEP, rumors once again abound. Beyond the rumblings about Data General and HP, there is the exciting possibility of a NeXTSTEP kernel server on a microkernel architecture, suggesting a fast, cheap way for NeXT to port to a plethora of other UNIX platforms in a fraction of the time.

★

Developers love objects. NeXT's thrust into the object world was trumpeted by various announcements on the Net: NeXT's objects catalog and CD-ROM; a third-party offering of palettes for Interface Builder; and the postings of developers struggling to enter this brave new world. A whole new business model is needed (and has been discussed on the Net) and it looks like NeXT is committed to pursuing it.

★

Way early. Even before the shipment of either 3.0 or 3-D apps, excited prerelease users on the Net have been trading RIB files (the 3-D representation files used by RenderMan) via the archives, as the possibilities of 3-D begin to take hold in the community's mind.

★

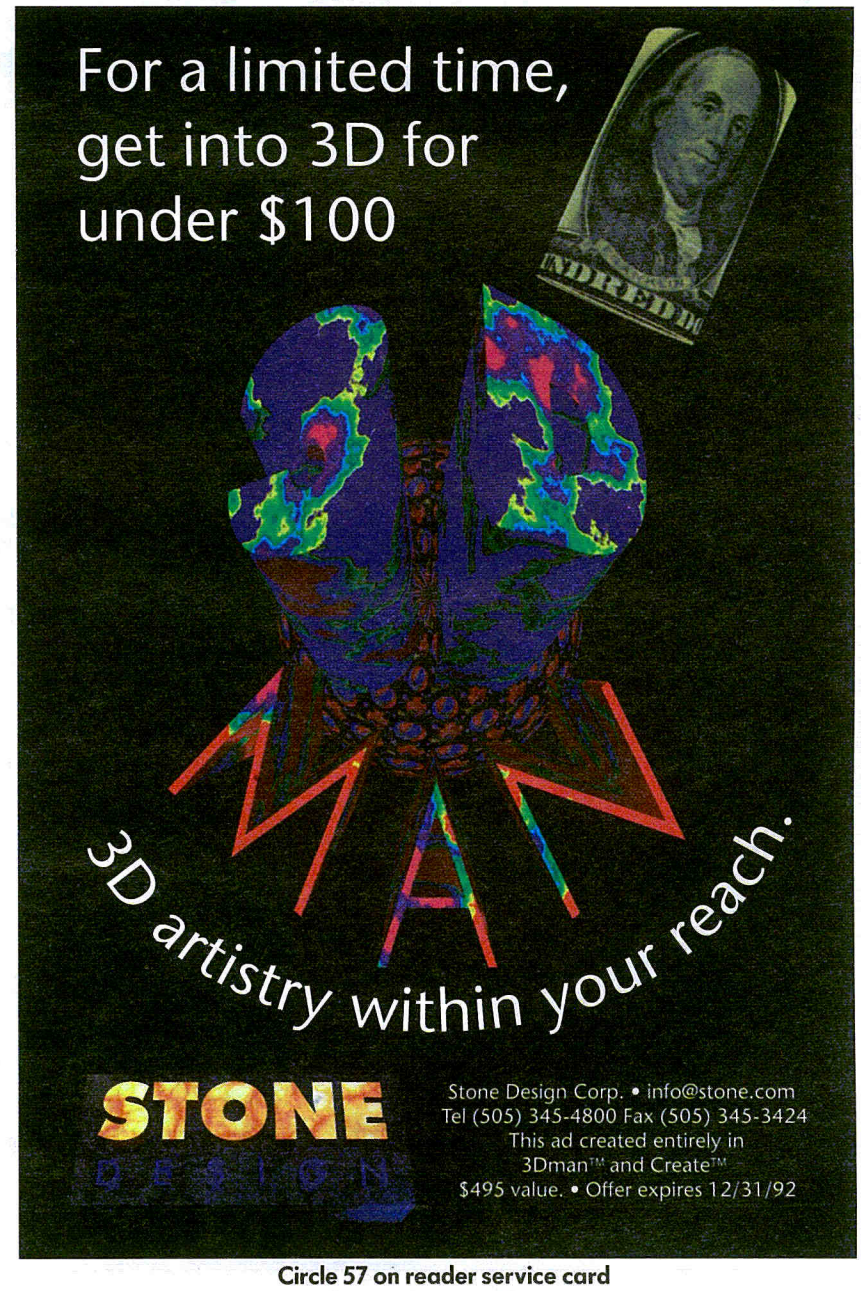
Way late. After two major releases and at least as many years, it looks like NeXT will finally release a new *NeXTSTEP Concepts Manual* (the basic introduction for programmers). Word spread rapidly after a Canadian posted an article with the ISBN numbers of the new "NeXTSTEP: Release 3.0" series of Addison-Wesley books, which were due to be released in October. New titles in the (now) seven-book series include *Object-Oriented Programming and the Objective-C Language* and *User Interface Guidelines*.

★

Settling in. The four new comp.sys.next groups (.advocacy, .hardware, .software, and .marketplace) are thriving, causing the older groups to settle into new traffic patterns. Overall traffic is still at about 80 to 100 messages a day, but half the traffic in the .misc group and one-quarter the traffic in the .programmer and .sysadmin groups seems to have shifted into the new groups. The most inflammatory discussions have been in the .advocacy group, with .misc coming in second.

★

The '90s and beyond. In an exciting demonstration of NewsGrazer, Morris Meyer, a leader of the NeXT ISDN project, showed what the new log in panel will look like



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as you login to your office NeXT from your home NeXT , using ISDN. The home machine looks and acts exactly like the other. This exciting preview of an until-then unknown aspect of 3.0 can before any prereleases were shipped.

★

Tone it down. General comments about the stability and functionality of the prereleases of 3.0 seem mostly favorable, except on the subject of color. Besides the valid technical points (that having color icons and buttons everywhere deepens window depths and slows down color machines), many found the 3.0 colors to be garish, inappropriate, and un-NeXT-like. Particularly bitter scorn was heaped on Interface Builder's gold icon and the "technicolor wait cursor from hell."

★

NeXT scores. The announcement of Presto, at last a viable commercial MIDI-sequencing app, presages a whole slew of music software. One such free app discussed recently, ModPlayer, generates musical interludes from the numerous and ubiquitous Amiga ModPlayer music files available on the archives.

User Group News

From all over. New NeXT groups formed this quarter in southern Connecticut, Singapore, Russia, Toronto, and Charlotte, North Carolina, to name a few. This brings the total on International NeXT User Group Manager Conrad Geiger's "Geiger Counter" to 360, with over 200 groups in North America. Now 35 countries have groups.

★

Far East. In Hong Kong, Bill Schell reports that the Hong Kong NeXT User Group has increased its membership to 25. In Taipei, the Taiwan NeXT User Group hosted a NeXT developer class during August, says David Li.

★

Outreach in Europe. Gianfranco Pocecai reports that the NeXT2You Italian group will have a special meeting the first week of October during SMAU, the big computer expo in Milan. In Switzerland, NeXT Paradigme's Daniel Allgoewer reports that a September 3 press conference was scheduled to introduce NeXT to the French and Swiss media. Paul Beaumont of the UK NeXT User Group says that the group will sponsor a booth at the MacUser Show in Olympia October 28 to 31.

★

Regular updates. The BCS (Boston) NeXT User Group now has about 500 members. It meets the first Tuesday of every month on the MIT campus in Room 1-190. New NeXT publishing and connectivity SIGs have formed in Salt Lake City. Demos and tutorials are the focus at regular meetings (the third Wednesday of the month, in the Dynatronics conference room) of the new Salt Lake City NeXT User Group. The Calgary NeXT User Group recently held a successful NeXT minideveloper class.

★

La-la land report. The 250 members of SCaN (Southern California) include faculty and student members from many of the major universities in the area and several community colleges. Membership also includes representatives from NeXT users like the William Morris Agency and the Los Angeles County Sheriff's Department, as well as professional software developers, computer animation artists, developers of academic courseware, and research scientists. They even have a retired couple who uses the NeXT to produce a church bulletin.

by CHARLES L. PERKINS & DAN LAVIN

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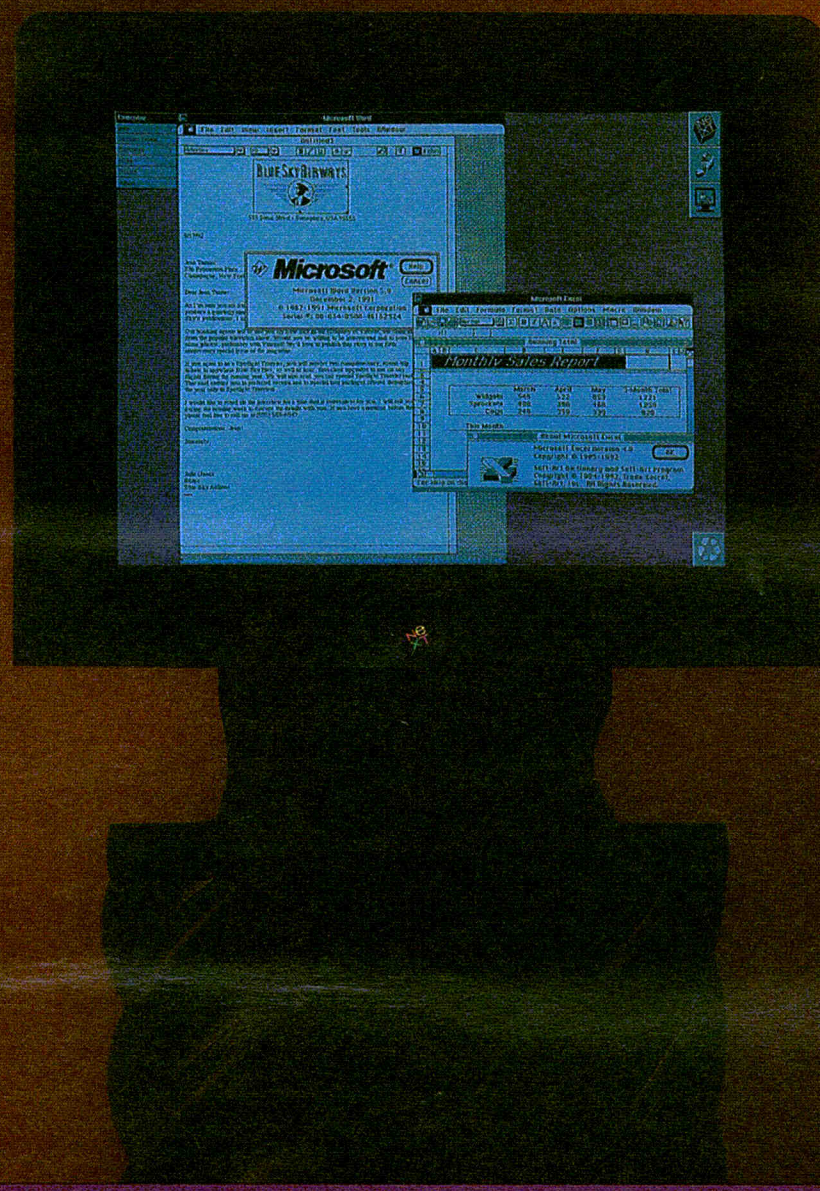

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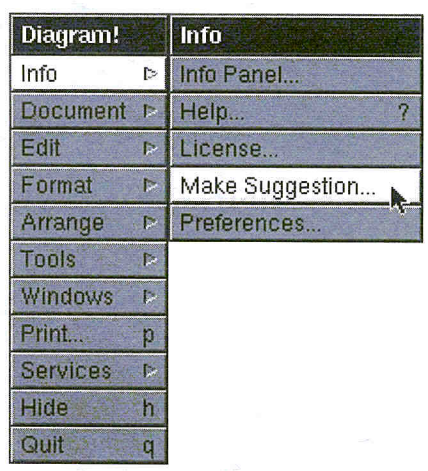

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NEWS IN BRIEF

Addison-Wesley is due to release the *NeXTSTEP User Interface Guidelines: Release* on November 1. Other 3.0 documentation should be available within the month, and all of the documentation will be on-line with the new OS. Manuals may be available at local bookstores or can be purchased from Addison-Wesley at 617/944-3700.

Music Kit for NeXTSTEP 3.0 now available from Stanford's Center for Computer Research Music and Acoustics (CCRMA) the Kit's new home. The new release includes the full source code, in addition to the Objective-C libraries that comprised the prior release. The CCRMA Music Kit is available via **ftp** from ccrma-ftp.stanford.edu. Stanford is also hoping to make it available on CD-ROM for those without **ftp**.

CD-ROM offerings are under way. NeXT plans to distribute its disc of educational freeware and objects at the 1992 EDUCOM conference in Baltimore Maryland, October 28–31. Sex Lies, and CD-ROM, from the Bay Area NeXT User Group; and Jewel of the Matrix, from Object Horizons, offer collections of shareware, demos, public-domain software, and assorted items of interest from archive sites and elsewhere.

Xanthus International, based in Stockholm, Sweden, has released LaserMan, an application for controlling laserdisc players from the NeXT, either directly through a remote control on the computer screen or through messages from other applications via a Speaker/Listener interface. The application can also be used with CraftMan, Xanthus's multimedia programming tool for the NeXT. Xanthus can be reached at laserman@xanthus.se.

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NEXTWORLD EXTRA OCTOBER 1992

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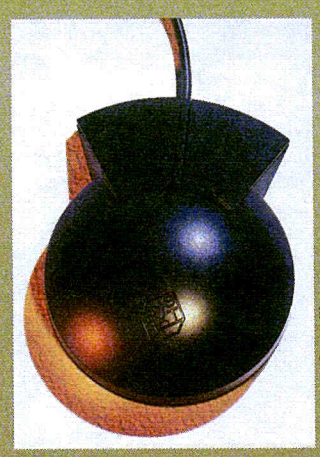
Stedi-LANding System for the NeXT, an integrated hardware and soft- [CONTINUED ON PAGE 22]

New keyboard, mouse ready to play on Turbo

by DAN LAVIN

Redwood City, CA – Quietly making a major change to its hardware, NeXT was scheduled to ship in September an improved ergonomic keyboard and mouse with all new NeXTstation Turbo Color machines.



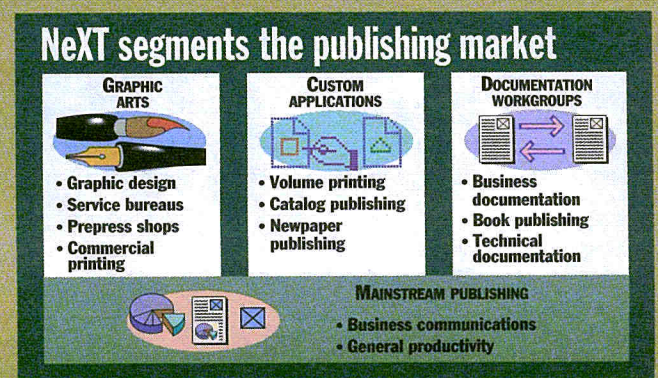
PHOTOGRAPH BY STUART WATSON

New NeXT mouse molds to the hand for improved ergonomics.

Major modifications to the keyboard include a thumb-controlled Command bar, Help keys that give context-sensitive assistance, ergonomic shaping of the keycaps and base, and a knob for adjusting the keyboard to variable heights. The mouse is now round and moves with a lighter touch than its older, rectangular cousin.

The new hardware uses the ADB (Apple Desktop Bus) standard, allowing NeXT owners to use some third-party peripherals, like keyboards, mice, and trackballs, manufactured for the Macintosh.

The old input electronics aren't compatible with ADB, so only new Turbo Color slabs shipped after the September changeover will sport the new keyboard and mouse. Owners of earlier Turbo Color machines may upgrade, but only the older input devices will be available to owners of all other configurations.



NPE takes hold

by DAN RUBY

San Francisco – NeXT came to the Seybold Conference here with its first coherent plan for selling systems in the electronic publishing market. After months of struggling to define a distinct market in the publishing universe, NeXT has brought its developers in line around a strategy that positions its technology in both vertical and horizontal applications.

The computer-publishing conference was held September 23–25 at Moscone Center.

"NPE [NeXT Publishing Environment] leverages the object-oriented nature of NeXTSTEP to enable customers to quickly build mission-critical custom-publishing solutions for workgroups," said Dave LaDuke, NeXT's publishing market manager. "These solutions can be completely customized in-house or assembled by users from off-the-shelf applications."

The strategy targets four market areas:

• *Graphic arts.* NeXT believes it can compete in the segment of the publishing market most identified with desktop-publishing tools on the Macintosh. Shrinkwrapped applications for page layout, illustration, and image processing address the needs of graphic designers. NeXT can also connect to existing Mac workgroups for greater power in production functions: scan- [SEE SEYBOLD, PAGE 21]

ODI prepares to conquer NeXT world

by SIMSON L. GARFINKEL

Redwood City, CA – NeXT's joint-development effort with Object Design (ODI) is big news for both independent software vendors and custom-application developers. ObjectStore 2.0 – once ported to NeXTSTEP – will provide a powerful, yet easy-to-use, system for storing and sharing data among different users and applications.

With a promised 1992 ship date, the initial fruits of the relationship should appear next summer, with even bigger payoffs in '94 or '95, assuming NeXT delivers on its [SEE ODI, PAGE 21]

'486 options broaden

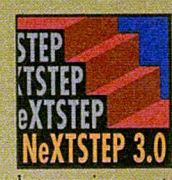
by DAN LAVIN

Redwood City, CA – The range of hardware options available to NeXTSTEP '486 customers will be broader than originally anticipated. Early details of hardware configurations and graphics standards to be supported suggest that high-end models from most major '486 manufacturers could be easily certified for NeXTSTEP with no hardware modifications.

Some high-end laptop, and even notebook, computers could also reportedly meet the specifications listed and run NeXTSTEP.

NeXTSTEP '486 machines will require no more memory or storage than equivalent NeXT models, according to Robert Lawton, NeXTSTEP '486 program manager. Monochrome machines will need 8MB of memory and a 120MB hard disk. Color machines will need 16MB of memory and the same size hard disk. The new OS will support both the widely available IDE- and SCSI-standard hard disks. [SEE '486, PAGE 22]

Users ready to go with 3.0



by ELIOT BERGSON

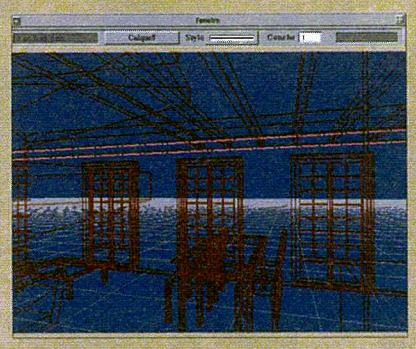
Based on varying degrees of success with beta versions, system administrators are using different implementation strategies for NeXTSTEP 3.0.

The 34 developers at Williams Telecommunications, of The Woodlands, Texas, reported to NeXT about 300 bugs in the first prerelease version (PR1) of NeXTSTEP. "Some of the biggest problems – believe it or not – were the compiler, and bugs in the debugger. Some software just quit working, too," said Vince Jordan, director of information systems.

Under the second prerelease (PR2), developers "never got to the point where they couldn't do their work, so we blasted PR2 across the user community," Jordan said. [SEE NEXTSTEP, PAGE 22]

French CAD to woo NeXT 3-D designers

by KRISTIN DYER



ZZvolume will allow architects to walk through a house before it is built

Lyon, France – 3-D CAD has finally arrived on the NeXT, but it may be a while before it makes its U.S. debut.

ZZvolume, authored by Géry d'Ivry and available for several years now in France on the Atari platform, will be available in France on the NeXT in November and may be available in the United States by December if a distributer is found. Pricing has not yet been determined.

Aimed at architechts and designers, ZZvolume is based on a custom 3-D engine, allowing it to run under NeXTSTEP 2.1. The engine optimizes wireframe rendering speed but is capable of working with Pixar's Photorealistic RenderMan in NeXTSTEP 3.0 for solid-model rendering.

ZZvolume will ship with a library of 200 predefined objects and a language for describing new ones. 2-D and 3-D support for DXF, DEF, EPS, RIB, STAR-UX, and the Atari 3VD formats should make switching programs tolerable. An English-language interface and documentation are set to be released with the U.S. version.

Géry d'Ivry can be reached at ARES, 8 rue Victor Lagrange, 69007 Lyon, France. Or telephone 33/72/73.06.54.

SNMP tools ready to network

by SIMSON L. GARFINKEL

Malibu, CA – A set of programs have been released that implement the Simple Network Management Protocol (SNMP) and are sure to ease the management of large NeXT networks, according to Errol Ginsberg, president of Ridgeback Solutions, a new NeXT developer in Southern California.

SNMP Agent is Ridgeback Solutions's new program that allows real-time remote monitoring of log-ins and log-outs throughout a local-area network. The system will also report swapfile size, available disk space, and the status of applications on each NeXTstation. Because SNMP Agent uses the standard SNMP protocol, the status of NeXT workstations can be viewed in commonly available network-management programs such as Sun Microsystem's SunNet Monitor or Hewlett-Packard's Openview application, Ginsberg said.

For NeXT-only sites, Ridgeback is offering ServerWatch, a NeXTSTEP application that displays icons for up to 20 NeXT machines and allows monitoring of the information provided by SNMP Agent.

The standards-based approach is important for companies that wish to have an overall network-management strategy, said Ginsberg. Future versions of ServerWatch will probably include provisions for third-party add-on modules, he added.

Ridgeback's first big installation will be Phibro Energy, which will monitor its network of NeXTstations with a Sun workstation running SunNet Monitor, said Jonathan Fields, MIS manager for the Connecticut-based resources-trading firm.

SNMP agent costs $120 per workstation. ServerWatch comes bundled with purchases of ten or more copies of SNMP Agent. SunNet and Openview extensions cost $1000 per network-management console.

Ridgeback can be reached at 310/456-6094.

Boss comes back with 2.0

by DAN RUBY

Mountain View, CA – Boss Logic will extend its active document-managment system with richer features for compound documents, version control, and notification. Document Manager 2.0, set for release this month, also includes an API (application program interface) to allow closer integration with other programs.

The new release confirms the company's interest in the NeXT market, after spinning off its custom-development business and announcing plans for a Windows port early this year.

According to Peter Rip, president of Boss Logic, the upgrade positions Boss as a total information-management system, in contrast to competitive programs that store and retrieve documents but provide little in the way of managerial control.

Key new features include the ability to manage compound documents and relations between documents; automated notification of document changes; the ability to control access to parts of documents; management reporting of document histories and audit trails; and templates for easy setting of document attributes. The API will permit developers and customers to access the program's functions through alternative user interfaces, the company said.

The Boss system consists of server and client software and includes a full run-time version of Sybase, the underlying database for the program. It is priced at $995 per user and is available as a shrinkwrapped product or through VARs and system integrators.

Boss Logic can be reached at 415/903-7000.

Mesa begins calculations

by SIMSON L. GARFINKEL

Cambridge, MA – "Mesa has been shipping since today," said David Pollak, the proud president of Athena Design, speaking before a hundred NeXT enthusiasts at the August 4th meeting of the Boston Computer Society NeXT User Group.

In many ways, Mesa is the most advanced spreadsheet on any platform, Pollak said.

Mesa is a full-featured, two-dimensional spreadsheet that contains many features found in popular DOS spreadsheets such as Lotus 1-2-3 and Excel. The program can read Lotus 1-2-3 files and execute most Lotus macros. It supports full drag-and-drop of color, fonts, spreadsheet cells, and graphics. Its recalculation speed of 13,000 cells per second makes it one of the fastest spreadsheets available on any platform.

The crowd was most impressed by Mesa's Object Library Interface, which allows Mesa to be used as a computation or graphing engine for a customer's own custom applications. Pollak demonstrated a sample application that generated real-time data, transmitted it to Mesa for modeling and graphing, and displayed a resultant graph in the custom application's own window.

Athena Design is also working with San Diego–based Pages Software so that Mesa spreadsheets will be editable directly from that company's soon-to-be-released application. "You'll be able to edit the spreadsheet data right in your word processor. You won't have to live in your spreadsheet anymore, Pollak said.

Stations use Turbo chip set

by DAN LAVIN

Redwood City, CA – NeXT in July began shipping standard black-and-white 25MHz NeXTstations with the more powerful chip set used in Turbo stations, improving performance. The 68040 CPU, however, remains at 25MHz.

NeXT made the change to increase manufacturing efficiency in 25MHz machines, starting with serial number ABB0028000. The new chip set increases performance by providing a more sophisticated memory-management subsystem and better peripheral controller.

The enhanced systems use the same type of memory as all other NeXTstations (72-pin, 70-nanosecond SIMMs, single- or double-sided).

In another change, the new Turbo Color machines equipped with ADB (Apple Desktop Bus) support have a monitor with a slightly higher scan rate – 72Hz versus 68Hz – that is easier on the eyes.

Upstart creates remote NeXTs

by DAN LAVIN

Palo Alto, CA – A hardware/software combination called Upstart was scheduled to ship in late August that allows users to operate any NeXT machine without a monitor, keyboard, or mouse.

NeXT machines on a network dedicated as print, communication, file, or NFS servers do not require monitors or input devices. The Highland Digital product sells for $195 and allows users to buy plain workstation CPU units that are then controlled remotely over a heterogeneous network. Users can save over $1000 on a typical configuration.

The solution, developed in cooperation with Robert Nielsen, of Everest Technology, consists of a hardware plug that goes in the MegaPixel Display port, and software that traps messages that the CPU tries to send to the missing hardware.

This is the first product for Highland, a large NeXT VAR (value-added reseller). Its next product will be related to imaging and document management.

Highland Digital can be reached at 415/493-8550.

CuillaMartin updates utilities

by KRISTIN DYER

Greyslake, IL – The CuillaMartin Company has announced upgrades of two of its NeXT products, DefaultManager and Calculator Set.

Previously a freeware program available from Internet archive sites, DefaultManager has been upgraded to take advantage of features in NeXTSTEP 3.0. DefaultManager version 3.0 uses a graphical interface to access, modify, store, and retrieve NeXTSTEP-program default settings. New features include the ability to open default databases for several users at once, simplifying system administration, and complete integration with NeXTSTEP 3.0's on-line Help system.

The Calculator Set has been combined into a single application with new features. The previous Basic, Scientific, and Conversion features are included, along with a Business component.

Both products are $79 for a single user, $699 for 10 copies.

For more information, contact CuillaMartin Company at 708/233.5164.

ODI [FROM PAGE

promise to incorporate persiste object storage into NeXTSTEP.

ODI is the dominant player in the persistent-object databas market (see story below). These databases give programmers a way to store Objective-C, C++, or Smalltalk objects directly fro an application without having t first save objects as text in files. Object-oriented (OO) database manage version control on an object-by-object, rather than d ument-by-document, level. As a result, different users can easily edit the same document at the same time, creating multiple ve sions, and then merging the ver sions back into a single whole.

ObjectStore is critical to the NeXT, said Thomas M. Atwoo ODI's founder: *Fortune 1000* companies building object-orie ed applications need a program ming environment, GUI builde and object-oriented database. ODI approached NeXT, sugges ing that pairing the strongest o GUI-builders with the strongest databases would be an unstop-pable combination. NeXT agre and the companies decided to embark on a multiyear, multim lion dollar development effort.

Claiming 40 percent of the O database market, ODI's custome are largely CAD and CASE devel opers and include IBM, which us ObjectStore to hold integrated ci cuit designs.

Pricing is not set, but Atwo suggested that a NeXTSTEP developer's kit for independen software vendors will cost $15 to $3000.

ObjectStore cuts app size

by SIMSON L. GARFINKEL

To use ObjectStore, developers give the database a description o the objects and memory structures used by their applications, then declare the object represen ing a document to be persistent. ObjectStore does the rest, automatically saving the document, giving it a name, and loading the document back into memory at some future point in time.

Storing a document in an object-oriented database also gives the user much finer control. The database provides version management and branch tracking for every object inside the database, making it possible to open a blueprint and see the way the design has changed.

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n features are included, along
th a Business component.

Both products are $79 for a
gle user, $690 for 10 copies.

For more information, con-
t CuillaMartin Company at
8/233.5164.

ODI [FROM PAGE 19]

promise to incorporate persistent-object storage into NeXTSTEP.

ODI is the dominant player in the persistent-object database market (see story below). These databases give programmers a way to store Objective-C, C++, or Smalltalk objects directly from an application without having to first save objects as text in files. Object-oriented (OO) databases manage version control on an object-by-object, rather than document-by-document, level. As a result, different users can easily edit the same document at the same time, creating multiple versions, and then merging the versions back into a single whole.

ObjectStore is critical to the NeXT, said Thomas M. Atwood, ODI's founder: *Fortune 1000* companies building object-oriented applications need a programming environment, GUI builder, and object-oriented database. ODI approached NeXT, suggesting that pairing the strongest of GUI-builders with the strongest of databases would be an unstoppable combination. NeXT agreed, and the companies decided to embark on a multiyear, multimillion dollar development effort.

Claiming 40 percent of the OO-database market, ODI's customers are largely CAD and CASE developers and include IBM, which uses ObjectStore to hold integrated circuit designs.

Pricing is not set, but Atwood suggested that a NeXTSTEP developer's kit for independent software vendors will cost $1500 to $3000.

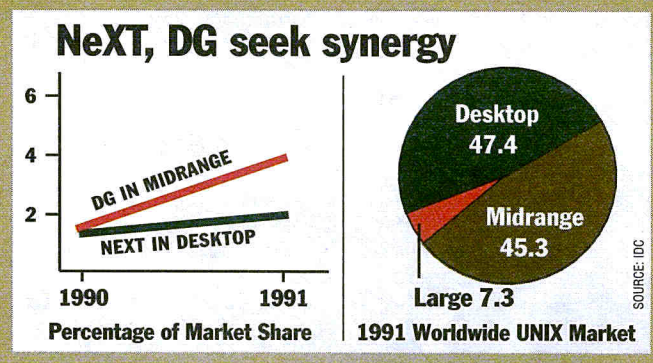
ObjectStore cuts app size

by SIMSON L. GARFINKEL

To use ObjectStore, developers give the database a description of the objects and memory structures used by their applications, then declare the object representing a document to be persistent. ObjectStore does the rest, automatically saving the document, giving it a name, and loading the document back into memory at some future point in time.

Storing a document in an object-oriented database also gives the user much finer control. The database provides version management and branch tracking for every object inside the database, making it possible to open a blueprint and see the way the design has changed.

BUSINESS NEWS



Data General sets NeXT agenda

by KRISTIN DYER

Westboro, MA – Data General Corporation and NeXT announced in August a partnership for Data General to resell NeXT workstations with Data General's AViiON servers (see "Data General turns to NeXT," *NeXTWORLD Extra*, August 1992).

As part of the client-server solution, Data General will also port the NeXT NetInfo network-administration software to its servers for a more integrated management system, according to Stephanie Bigusiak, Data General's manager of external communications.

Data General sells primarily to high-end vertical markets, including the government, manufacturing, and geographic information systems. The company hopes to make headway into the financial and healthcare markets by comarketing its servers with the quick-development and multimedia capabilities of the NeXT.

NeXT's new DBKit and its capability to fashion front-end interfaces will play an important role in the client-server solution, said Bigusiak. AViiON servers currently support Oracle, Sybase, Ingres, and Informix relational databases.

For additional information, contact Data General Corporation at 412/921-5401.

Morgan drops NeXT

by ELIOT BERGSON

New York – After establishing a pilot program with 50 NeXTstations in its emerging markets trading division, J.P. Morgan and Company has dropped the NeXT from consideration as the platform of choice in its global trading departments. Senior executives decided instead to standardize all development for trading activities in the C++ and Smalltalk programming languages.

Details of the decision, which caught many in the NeXT community by surprise, were based on information that appeared in the August 10 issue of *Trading Systems Technology*, a New York trade publication.

A spokeswoman for Morgan confirmed that NeXT was out, despite users' enthusiasm for the NeXT's development speed. Work done on the NeXT will be ported to Suns or Macs, she said. Morgan has not said what it will do with the 50 NeXTs.

Sources attributed the decision to pressure from technological interest groups. "The project was a success. We had delivered all of the initial functionality [on the NeXT] we had committed to," said a source at the company, adding that Morgan's NeXTSTEP developers were "on the eve" of the first global implementation across three continents. "But the decision to switch was not a technological decision. It was a business decision. There was incredible pressure because of the sizable Sun and Apple group installed [here at Morgan]."

NeXT Financial Services Market Manager Jim McCrory agreed. "Political pressures in the bank won't let [the applications developed under NeXTSTEP] be deployed. There's a tremendous amount of resistance to change."

Morgan executives have made no decision on future of NeXT in other trading or banking divisions. But, McCrory said, "Morgan will look back at its past experience with NeXT and say, 'I shoulda married that gal I dated in high school.' "

Versant ports OO database

by ELIOT BERGSON

Menlo Park, CA – After an initial sting from the agreement between Object Design (ODI) and NeXT announced at Object World in July, Versant Object Technology is moving ahead with the first ODBMS for the NeXT.

"ODI's product is a language extender, for developers," said Matthew Miller, director of corporate marketing for Versant. "VERSANT for NeXT is tailored for a network with data residing on different nodes."

NeXT CEO Steve Jobs has realized that there are two segments to the OO-database market and given public support to the product, Miller said.

VERSANT for NeXT, due out before year's end, has an introductory price of $995. It is currently under beta testing at Williams Telecommunications, in The Woodlands, Texas, which helped write the Objective-C interface for the product.

Canon Color coming soon

by DAN LAVIN

New York – Canon USA plans to ship in the fourth quarter its long-awaited color publishing solution, which includes the NeXT-based Color PowerStation and connectivity to the Canon Laser Copier (CLC) 500.

"Canon is positioning the PowerStation as a high-end print-and-image server dropped into predominantly Macintosh and/or Windows-based professional publishing environments," said Ahmed Zaatari, national sales manager for Canon USA's System Sales division. Using NeXTSTEP 3.0's new connectivity features, customers can bring the advantages of the NeXT to their existing Mac and PC environments.

The basic system is a NeXTstation Turbo Color machine that is networked to a CLC 500 and a Canon Image Processing Unit (IPU) 10, which manages throughput between the two. Bundled software for the NeXT includes applications for intelligent print-queue management, Open Prepress Interface (OPI) image management, and job tracking. Optional software is available for using the CLC as a color scanner. System configurations start at about $15,000 for existing CLC and IPU owners and $100,000 for systems including the CLC and IPU.

As a print server, the PowerStation can use Ethertalk to connect to many different output devices, including the CLC. Since the NeXT serves as both a print spooler and PostScipt RIP, users can continue working on individual Macs or PCs during printing.

The system traps files with PostScript errors to prevent the print queue from crashing. Further, each client requires far less memory and hard-disk space than in a traditional publishing environment. Job-tracking software will help take the current guesswork out of time and materials billing. A service bureau or corporate art department equipped with a PowerStation can also handle NeXT output or convert their whole operation to a NeXT-based environment. [SEE CANON, PAGE 22]

Seybold [FROM PAGE 19]

ning, printing, and workflow management.

• *Custom applications.* NeXT will build on its strengths in object-oriented development to target customers with mission-critical requirements for process automation, links to databases, and customized user interfaces.

• *Documentation workgroups.* NeXT will attack Sun's stronghold in the structured-document market with solutions that combine applications for document production with software for group productivity.

• *General business.* Broad horizontal applications will enhance sales to general business users in all markets.

NeXT planned to demonstrate workgroup solutions combining shrinkwrapped and modular tools in each market area in its booth at the Seybold show.

Third-party developers said that they were genearlly pleased by NeXT's new, inclusive definition of NPE.

"NeXT got sidetracked by the earlier debate over objects versus shrinkwrapped. These targets are reasonable and NeXT has a reasonable chance of meeting them," said Rand Schulman, marketing director for Pages Software.

The San Diego-based company exhibited its new page-layout software running under NeXTSTEP '486 at the Seybold show.

BRIEFS Continued

ware system that provides computer power monitoring, backup, diagnostics, and pure power protection, is now shipping from StediWatt. The system, which works across a network, monitors power conditions and prevents data loss caused by power surges and blackouts. Systems start at $1145 and include a three-year limited warranty, a free year of software upgrades, and toll-free technical support. StediWatt: 717/263-5681.

TalkBack allows users to conference across the office or the ocean. Participants can exchange text, file, and voice messages with single or multiple attendees. The decentralized model allows users to join and exit conferences at will. Single-copy price is $95. For educational and group pricing, contact NightShade Software: 403/492-9343; e-mail: nshade@niagro.ucs.ualberta.ca.

ANDI (Association of NeXTSTEP Developers International) was due to begin its nationwide communications network in late August. Members will be able to get dial-up connectivity to ANDI and the Internet at speeds of up to 2400 baud. ANDI also claims to be the first to provide dial-up ISDN Basic Rate Service. MCI has been selected as ANDI's telecommunications provider and will offer a special discount ANDI. ANDI: 301-681-3932. MCI:800-283-0200

Bäcchus Software began shipping PixelMagician version 1.2, the latest incarnation of its universal file viewer and translator. New features include support for NeXT FAX and DCX image formats and viewing of multipage and multirepresentational formats such as PS, EPS, FAX, and TIFF. PixelMagician costs $299. Bäcchus: 310/820-9145, 310/820-5930 fax.

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Editor: Dan Ruby; Managing Editor: Connie Guglielmo; Associate Editor: Eliot Bergson; News Editor: Dan Lavin; Staff Writer: Simson L. Garfinkel; Layout Chief: Sue Troy

NeXTSTEP [FROM PAGE 19]

The official release was just "an overnight move."

Hadar Pedhazur, vice-president of equities technology at Union Bank Switzerland Securities in New York, agreed that PR2 was "vastly superior" to the first prerelease. "If push had come to shove, and NeXT said they wouldn't be able to deliver 3.0 until December, I'd have felt fine about putting PR2 on every machine," he said.

After missing several summer ship dates, NeXT shipped NeXTSTEP 3.0 in early September.

Corporate sites with NeXT machines in more than one office have deployed the new OS more slowly.

The William Morris Agency set up a network-testing environment between its Beverly Hills, California, and New York offices and brought up the West Coast office first when the final release arrived.

Because First National Bank of Chicago has "tricky interdependencies with software on the trading floor," the full implementation of 3.0 for its 250 NeXTs in Chicago and London "may be delayed a month," according to Assistant Vice-President Dan Crimmins.

Swiss Bank Corporation/O'Connor Services has rolled out 3.0 in its Chicago and London offices, "but there's always a lot of work in any system upgrade," acknowledged Vice-President Bill Martin. "We'll have to see how it works. It still has to prove itself once it's on the net." On the development side, Martin said PR1 and PR2 proved themselves admirably; a summer intern wrote a surface-modeling object to sit on NeXTSTEP's 3DKit.

Although developers haven't voiced complaints about NeXT's CD-ROM distribution strategy, only a few sites purchased more than one CD-ROM drive, from either NeXT or third parties.

'486 [FROM PAGE 19]

Most high-end '486 machines are capable of supporting these configurations. The newest generation of hard disks will make it possible for some notebook computers to offer users the storage necessary to use NeXTSTEP '486.

NeXT also expanded the choices for graphics support of the new OS, which will run on screens with resolutions from 640 by 480 pixels up to the NeXT standard MegaPixel Display. Most Super-VGA machines will be able to run NeXTSTEP in grayscale.

And while the first prototypes of a color '486 OS last January supported only a custom version of Dell's JAWS graphics standard, NeXT now reports that a range of off-the-shelf JAWS-like standards will be supported, including, but not limited to, Dell's JAWS, Chips and Technologies's Wingine, and certain LocalBus implementations.

Canon [FROM PAGE 21]

A third party is working with Canon on the OPI software. OPI allows users on client machines to work with low-resolution versions of large graphics files and manipulate them for placement purposes. The full-resolution image would remain on the NeXT, to cut down on processing time, and be recalled for output to a high-resolution device.

To the editor: Sullivan botched it

An item in Lt. Sullivan's column [July 1992] about Booz-Allen & Hamilton having "botched the job" at the L.A. Country Sheriff's Department was blatantly false and defamatory. In fact, Booz-Allen won the competitive solicitation for this project with excellent technical qualifications, but the contract was never awarded and Booz-Allen never started work on the project because the department was not able to obtain funding.

Despite your editorial notice that the Lt. Sullivan column appears without guidance from the *NeXTWORLD* staff, *NeXTWORLD* is a respected and widely read publication that must be responsible for the material it prints. Booz-Allen & Hamilton must insist on a full and prominent correction of this libelous material.

MARIE L. LERCH
DIRECTOR, PR AND COMMUNICATIONS
BOOZ-ALLEN & HAMILTON

Change of porcelain in Microsoft throne room?

Back at the analysis desk at the Agency, Lt. Sullivan spends a lot of his time verifying intelligence reports from the field. A lot of them don't stand up to the truth test, as has been the case with most of the tips that periodically come in regarding Microsoft and NeXT. Until now, Bill Gates's statement that he would rather piss on NeXT than develop for it has been the operative policy.

Now, Microsoft might be changing fixtures in the executive washroom. Sullivan has received reliable reports that emissaries from Redmond have quietly contacted several well-known NeXT developers seeking help in porting one or more Microsoft applications to NeXTSTEP. Seems the world's sixth-richest man doesn't like sitting out of any software market, and he may have finally realized that there are real dollars to be collected from the NeXTSTEP table.

It's just one more sign of the excitement over NeXTSTEP '486, which returns to the front burner now that 3.0 is out the door. First priority is patching up relationships with OEM partners who have been neglected since the first wave of '486 euphoria early this year. Down in Texas, Sullivan heard rumblings of Dell's dissatification with NeXT for talking with competitors before finishing contract negotiations. The rough spots have now been paved over with special drivers and other support code from Redwood City engineers.

Regarding NeXTSTEP 3.0, Sullivan found that beta testing the two prerelease versions was a welcome diversion. Unfortunately, he didn't find enough bugs to make the list of top testers who won prizes for their detective powers. The top ten winners, in order, were Pascal Chesnais, Simson Garfinkel, Piers Walter, Karl Kraft, Pete Clark, Mike Rutman, Ray Ryan, Andrew Loewenstern, Ron Antony, and Barry Lustig. The official contest ended in early August with Prerelease 2. What most people don't know is that there was also a PR3, which was shipped to only six developers, who had a scant four days to put it through its paces.

Remember the American Bar Association meeting in San Francisco this summer? While the press focused mainly on social and electoral politics, there was also some political skulduggery going on in the legal technology center. Inherent Technologies was there, showing prospective legal clients the advantages of NeXT. There were also plenty of Apple representatives hanging around, which may explain how the list of lawyers who had signed up for a NeXT demo mysteriously disappeared. No matter. The word on NeXT seems to be spreading in the legal community: One of the biggest law firms in London has signed on for up to 1200 units.

And people say you can't trust lawyers. What about bankers? A former consultant to J.P. Morgan's emerging markets group told Sullivan the sad story behind the deal-that-wasn't. It seems that conservative MIS managers felt NeXT couldn't provide the total integration for a single worldwide solution. Maybe they forgot that investment bankers make money by taking risks. The big losers are the quants on Morgan's trading desk, who may now have trouble competing with more far-sighted investment houses. It will be interesting to see whether Morgan also loses its business managing some of NeXT's and Steve Jobs's personal funds.

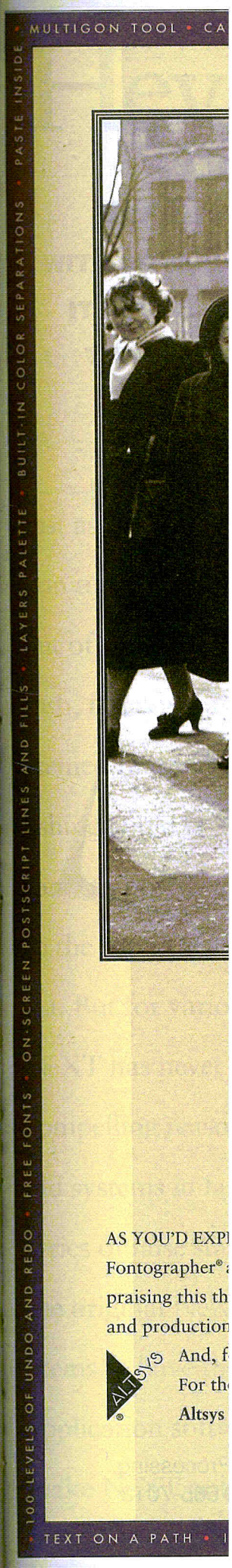
One of the reasons cited by Morgan insiders was NeXT's lack of a coherent server strategy. Until now, NeXT has taken the posture of being "server agnostic." Now, with the Data General deal done, NeXT may be getting religion. Look for an announcement soon of comarketing deals with several other server manufacturers, including Solbourne and Auspex Systems.

On the third-party front, Lighthouse Design has an interesting plan for Concurrence users. It's working on a filter that will read in files from Microsoft Power Point, one of the leading presentation apps for Windows and Mac, and convert them to Concurrence slide shows. Cross-platform sites are sure to be pleased, as they may also be by the ports underway of Serius Corporation's visual programming system and Xcelerated Systems's X Window–based Macintosh emulator, Liken.

Developers who may be rushing to prepare releases for NeXTWORLD Expo may have more time than they think. While the sponsors have been frustratingly quiet about their plans, Sullivan is certain that January is out and plans to keep his calendar clear for early March.

Lt. Sullivan

Make sure you're on the best-dressed list when Expo rolls around. Steve-signed T-shirts are still available in exchange for verifiable tips. Call Sullivan's voice-mail at 415/978-3374 or send him a note at sullivan@nextworld.com.



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Expo rolls around. Steve- for verifiable tips. Call Sulli- a note at sullivan@next-

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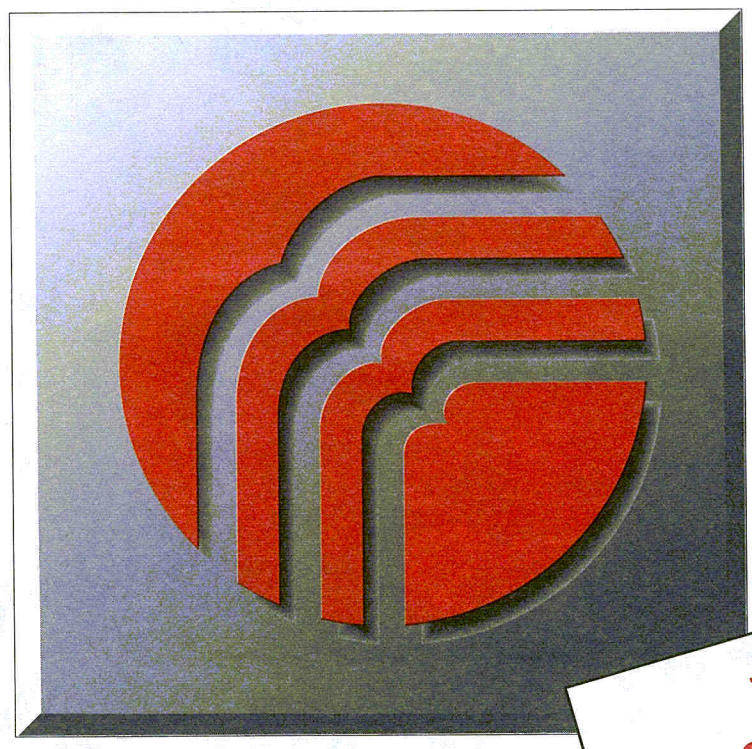

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ILLUSTRATIONS BY GORDON STUDER

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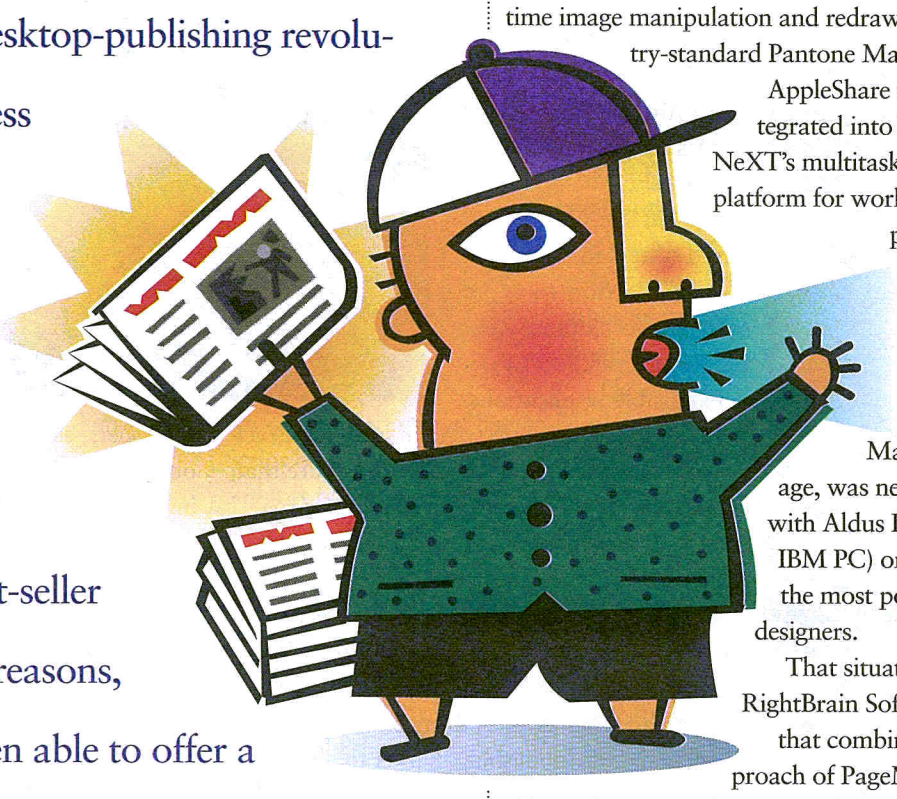
Hey Mac, Stop the Presses

NeXT has an immediate edge with new publishing software, but it seeks a long-term advantage through modular, extensible applications

BY CONNIE GUGLIELMO

Just as it took the desktop-publishing revolution to make a success out of the Macintosh, it has always seemed that publishing could be the force to push NeXT to the top of the best-seller list. But for various reasons, NeXT has never been able to offer a compelling reason for publishers to discard their old systems in favor of black slabs. Now, after a series of false starts dating back to the rollout of the original NeXT machine, the company finally seems to have the combination of technology, application software, and marketing strategy to make NeXT publishing take off.



ILLUSTRATIONS BY GORDON STUDER

The NeXT advantage

There has never been any question about NeXT's edge in the area of publishing. Among its greatest assets is the fact that it is a PostScript-based system through and through. With Adobe's PostScript driving output and Display PostScript driving the screen display, users enjoy one of the only computers that offers a what-you-see-is-really-what-you-get relationship between the screen and the printer.

Its other qualities are no less important. The NeXT's 400-dpi printer, driven directly from the CPU, provides fast, high-resolution printing; the NeXT Color Printer offers quality output at surprisingly low cost; the raw performance of the machine is extraordinary, permitting on-screen, real-time image manipulation and redrawing; NeXTSTEP 3.0 offers the industry-standard Pantone Matching System built in, as well as AppleShare support so that the NeXT can be integrated into Macintosh networks; and lastly, the NeXT's multitasking environment makes it a prime platform for workgroup computing, of which desktop publishing is one of the most obvious examples.

The catch? Until recently, there were few solid publishing applications available on the platform. Frame Technology's FrameMaker 3.0, a technical-publishing package, was neither designed nor able to compare with Aldus PageMaker (on the Macintosh and IBM PC) or QuarkXPress (for the Macintosh), the most popular tools used by publishers and designers.

That situation has changed with the arrival of RightBrain Software's PasteUp, a $795 program that combines the easy-to-use pasteboard approach of PageMaker with the typographical control of QuarkXPress. Also, San Diego–based Pages Software and Archetype of Waltham, Massachusetts, have taken innovative approaches to page layout on the NeXT and are getting ready to ship their software.

Other software categories have also filled out. In image editing, Appsoft Image and Compose in Color from Unter Ecker Software promise to make publishers forget all about Adobe Photoshop. The illustration category is strengthened with the release of Altsys Virtuoso, and there is a broad selection of programs for typography, scanning, and output, as well as in the publishing-related areas of sound, video, and presentations (see "Tools of the Trade" in this issue).

The strategy

Determined to capture the moment, NeXT has in recent months spelled out a strategy for conquering the professional publishing market that enables developers and customers to leverage work done in the NeXTSTEP

POINT

Modularity is NeXT's publishing advantage

BY PAUL TREVITHICK

Industry leaders have been talking about the coming age of modular applications for years. With its AppKit and Interface Builder, NeXT has taken us there, at least in the area of user-interface design.

To have modularity, there must be an application program interface (API) – a protocol that acts as a unifying framework. In the domain of publishing applications, Archetype has developed such a framework, the Document Engine (DE).

The DE can be thought of as a publishing-oriented extension to a computer's operating system. It provides at least four advantages:

Rapid application development. **By using a standard document object that can reduce the effort of building the document-manipulation portions of an application, the DE allows publishing apps to be produced five times faster. They can also be developed by end users for whom creating a major application is otherwise unthinkable.**

Modular components. **Small apps can be built for vertical applications not addressed by the monolithic shrinkwrapped approach. These apps are themselves modular, and new objects and capabilities can be added to them.**

Portable documents. **Documents can be moved from workstation to workstation and from application to application and still be revisable. Users have their choice of application.**

Workgroup publishing. **Applications in a distributed network can edit the same document at the same time. Version control, journaling, archiving, and other capabilities can be easily added, since the document is its own database.**

Of course, the DE is not the only engine technology relevant to the world of publishing. Image-processing engines such as Pixar's IceMan promise to revolutionize that application area; it offers a unifying framework for a certain class of applications.

It is not surprising that some developers have resisted the modular approach, since the advantages come at a price: You have to rewrite and restructure your application. Then again, switching to object-oriented programming in general has not been done without total rewrites either.

PAUL TREVITHICK *is president of Archetype Software.*

operating environment. Called the NeXT Publishing Environment (NPE), NeXT's plan is to offer its customers everything from shrink-wrapped publishing solutions to object building blocks for creating custom applications.

Between these two extremes, NeXT sees an important new category of software called modular applications, which it defines as shrink-wrapped applications that may be customized to some degree, and application frameworks called engines that will serve as the base for custom applications built with an assortment of objects from third-party developers.

"In order for NeXT to be successful in a publishing environment, we needed to find a compelling advantage that is 500 percent better than our competitors'," says Dave LaDuke, manager of publishing markets for NeXT. "The NPE concept is about leveraging our core strength, which is NeXTSTEP."

> "With Display PostScript, what you see is really what you get."

What NeXT's object-based system makes possible, in addition to rapid software development and tightly integrated software, is extensible applications. "We think an important trend in software development is toward more modular software that can be modified either a little or a lot by customers, depending on what their needs are," says LaDuke.

NeXT is also emphasizing that it has no interest in going into "direct competition with the Macintosh in the desktop-publishing market," and instead will focus its efforts on the "professional end of the publishing market that is still 70 to 80 percent uncomputerized."

To succeed, however, NeXT will have to do a better job of describing the benefits of the customization strategy than it has done trying to spell it out to developers.

The controversy

NPE wasn't always the broad-sweeping publishing vision that LaDuke describes today. When NeXT introduced NPE at the Seybold Seminars '92 publishing conference in late February, along with the NeXT Publishing Alliance (NPA), a group of NeXT developers who planned to produce products and support the NPE, several developers working on shrinkwrapped publishing software did not join in the applause (see the sidebars "Point" and "Counterpoint").

At the time, NeXT downplayed shrink-wrapped applications, describing the NPE as "a building-block approach to publishing solutions. Instead of large, multifunction, monolithic applications, the NeXT Publishing Environment encourages smaller software that can be configured to meet individual customers' needs."

In addition, the company seemed to give prominence to Archetype. Also decrying "monolithic" applications, Archetype announced a Document Engine (DE) with a tool kit of ready-to-use objects that could be linked to form full-featured publishing applications. Archetype President Paul Trevithick says his company decided to build the DE after a meeting he and other developers had with NeXT's LaDuke in the fall of 1991.

Since the challenge was to go beyond, rather than reproduce, what had been done on the Macintosh, Archetype had decided that the only way to create a suite of extensible, highly integrated applications for professional publishers, as NeXT wanted, was to adopt an object approach that was more than "just grafting a little on to the side of a sheer cliff – a monolithic application," Trevithick says.

But NeXT's announcement left some developers, such as RightBrain's Glenn Reid, with the impression that Archetype's DE was the core of the NPE. At the time, Reid's company was at work on PasteUp, its eagerly anticipated page-layout program.

"What NPE stems from in my mind was that NeXT didn't have any publishing applications and they needed to have something happen," says Reid.

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Even under this broader vision, NeXT reiterated that its compelling advantage remained with offering customers software that is customizable. To that end, says Acosta, NeXT will encourage its shrinkwrapped-software developers to find some ways to allow customers to modify and enhance their products.

"NPE as a modular solution differentiates between us and the Macintosh," Acosta says. "We see a trend toward people who want customizable solutions, but not everyone is going to want mission-critical publishing applications."

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With its new, broader definition of NPE, NeXT seems ready finally to compete for electronic-publishing desktops. With a robust set of shrinkwrapped applications, it hopes to win in head-to-head matchups with other publishing platforms. With its longer-range strategy for modular applications, NeXT is setting a framework for the future of professional publishing. The market will fill in the blanks.

CONNIE GUGLIELMO *is news editor of* NeXTWORLD Extra. *She can be reached at connieg@nextworld.com.*

COUNTERPOINT

Technology is great, but people buy products

BY GLENN REID

If people wanted object-oriented, modular, engine-based publishing applications, they would ask for them. But they don't. What they do ask for every day is tried-and-true shrinkwrapped applications.

Ordinary people don't care about technology; they just want good products. They don't buy injection-molded plastic and extruded aluminum; they buy Hondas and Harley-Davidsons. There's a lot of talk about "custom applications," but that's only because there isn't anything else to talk about.

NeXT continues to be plagued by the same chicken-and-egg conundrum that exists for any new computer manufacturer: People don't buy computers without software, and people don't develop software without a lot of computers in the market. Today, there are a few great NeXT developers shipping excellent products, and a lot of weak ports of old technology. There are still 15 or 20 absolutely critical applications that are missing.

The need is especially acute in the area of page layout and publishing. The NeXT is a natural-born publishing machine, as the advertisements from a couple of years ago pointed out. The only problem: no applications. People want QuarkXPress, but unfortunately (or fortunately, given that it's old technology) it doesn't exist on the NeXT platform. We at RightBrain believe we're filling that gap with our PasteUp page-layout application.

Nobody argues with me when I tell them that the NeXT platform is the best computer in the world today. If the NeXT were a high-end Macintosh and all it did was run Mac software, it would sell in the hundreds of thousands, because it is, quite simply, a lot better than any of the Macintosh line. And it's cheaper besides.

Instead, we all console ourselves because a few big companies are buying NeXTs to develop in-house software. That's fine, but nobody is really going to get serious about the computer until there's great software available for it.

NeXT already provides a dazzling array of technology that nobody quite understands. We don't need more bewildering technology; we need lots of great applications. NeXT really is a better Macintosh – just what the public wants it to be.

GLENN REID *is president of RightBrain Software.*

POINT

Modularity is NeXT's publishing advantage

BY PAUL TREVITHICK

ndustry leaders have been talking about the com-ng age of modular applications for years. With its AppKit and Interface Builder, NeXT has taken us here, at least in the area of user-interface design.

To have modularity, there must be an applica-ion program interface (API) – a protocol that acts as a unifying framework. In the domain of pub-ishing applications, Archetype has developed such a framework, the Document Engine (DE).

The DE can be thought of as a publishing-ori-ented extension to a computer's operating system. t provides at least four advantages:

***Rapid application development.* By using a standard document object that can reduce the effort of building the document-manipulation por-ions of an application, the DE allows publishing apps to be produced five times faster. They can also be developed by end users for whom creat-ng a major application is otherwise unthinkable.**

***Modular components.* Small apps can be built for vertical applications not addressed by the monolithic shrinkwrapped approach. These apps are themselves modular, and new objects and capabilities can be added to them.**

***Portable documents.* Documents can be moved from workstation to workstation and from application to application and still be revisable. Users have their choice of application.**

***Workgroup publishing.* Applications in a dis-tributed network can edit the same document at the same time. Version control, journaling, archiving, and other capabilities can be easily added, since the document is its own database.**

Of course, the DE is not the only engine tech-nology relevant to the world of publishing. Image-processing engines such as Pixar's IceMan promise to revolutionize that application area; it offers a unifying framework for a certain class of applications.

It is not surprising that some developers have resisted the modular approach, since the advan-tages come at a price: You have to rewrite and restructure your application. Then again, switch-ing to object-oriented programming in general has not been done without total rewrites either.

PAUL TREVITHICK *is president of Archetype Software.*

operating environment. Called the NeXT Publishing Environment (NPE), NeXT's plan is to offer its customers everything from shrinkwrapped publishing solutions to object building blocks for creating custom applications.

Between these two extremes, NeXT sees an important new category of software called modular applications, which it defines as shrinkwrapped applications that may be customized to some degree, and application frameworks called engines that will serve as the base for custom applications built with an assortment of objects from third-party developers.

"In order for NeXT to be successful in a publishing environment, we needed to find a compelling advantage that is 500 percent better than our competitors'," says Dave LaDuke, manager of publishing markets for NeXT. "The NPE concept is about leveraging our core strength, which is NeXTSTEP."

> "With Display PostScript, what you see is really what you get."

What NeXT's object-based system makes possible, in addition to rapid software development and tightly integrated software, is extensible applications. "We think an important trend in software development is toward more modular software that can be modified either a little or a lot by customers, depending on what their needs are," says LaDuke.

NeXT is also emphasizing that it has no interest in going into "direct competition with the Macintosh in the desktop-publishing market," and instead will focus its efforts on the "professional end of the publishing market that is still 70 to 80 percent uncomputerized."

To succeed, however, NeXT will have to do a better job of describing the benefits of the customization strategy than it has done trying to spell it out to developers.

The controversy

NPE wasn't always the broad-sweeping publishing vision that LaDuke describes today. When NeXT introduced NPE at the Seybold Seminars '92 publishing conference in late February, along with the NeXT Publishing Alliance (NPA), a group of NeXT developers who planned to produce products and support the NPE, several developers working on shrinkwrapped publishing software did not join in the applause (see the sidebars "Point" and "Counterpoint").

At the time, NeXT downplayed shrinkwrapped applications, describing the NPE as "a building-block approach to publishing solutions. Instead of large, multifunction, monolithic applications, the NeXT Publishing Environment encourages smaller software that can be configured to meet individual customers' needs."

In addition, the company seemed to give prominence to Archetype. Also decrying "monolithic" applications, Archetype announced a Document Engine (DE) with a tool kit of ready-to-use objects that could be linked to form full-featured publishing applications. Archetype President Paul Trevithick says his company decided to build the DE after a meeting he and other developers had with NeXT's LaDuke in the fall of 1991.

Since the challenge was to go beyond, rather than reproduce, what had been done on the Macintosh, Archetype had decided that the only way to create a suite of extensible, highly integrated applications for professional publishers, as NeXT wanted, was to adopt an object approach that was more than "just grafting a little on to the side of a sheer cliff – a monolithic application," Trevithick says.

But NeXT's announcement left some developers, such as RightBrain's Glenn Reid, with the impression that Archetype's DE was the core of the NPE. At the time, Reid's company was at work on PasteUp, its eagerly anticipated page-layout program.

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Tools of the Trade

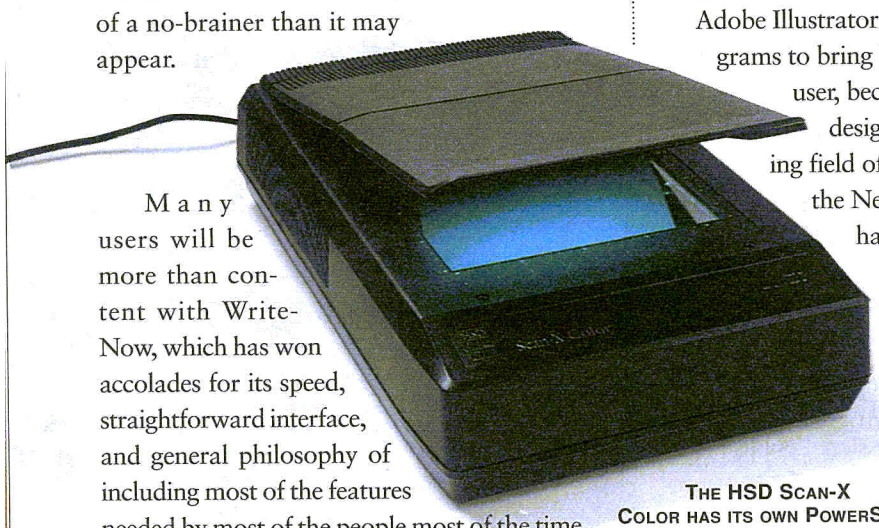
A CORNUCOPIA OF PRODUCTS FOR CREATION, DESIGN, AND PRODUCTION FITS THE BILL FOR ALMOST ANY NeXT PUBLISHING PROJECT

CREATION

No matter how complex, most publications consist of just three things: body text, graphics, and display type. Most likely, you will create each of these elements in a separate application, eventually combining them in a page-layout program. Because of the high degree of integration on the NeXT computer, this approach is less fraught with frustration than it is on other platforms. NeXT's adoption of PostScript and standards such as TIFF, EPS, RTF, and RenderMan's RIB file format, make it a simple matter to exchange files and incorporate existing libraries of fonts and clip art into a layout.

Text

Preparing text means either sticking with **WriteNow**, which has become the standard simply because it was once bundled with all NeXT hardware, or opting for the more full-featured **WordPerfect**. Unfortunately, this choice is less of a no-brainer than it may appear.



THE HSD SCAN-X COLOR HAS ITS OWN POWERSCAN DRIVER SOFTWARE.

Many users will be more than content with WriteNow, which has won accolades for its speed, straightforward interface, and general philosophy of including most of the features needed by most of the people most of the time. WriteNow's ruler-based formatting is easy to grasp, and basic features such as spell checking, search-and-replace, word count, mail-merge, and multiple headers and footers are well implemented. Graphics support is weak, however, and the program lacks high-end features such as a glossary, a thesaurus, style sheets, or tables.

WordPerfect's approach to multiple columns, style sheets, and graphics makes it a superior choice if you want to stay with one program. The program includes a full complement of word-processing features, including a browser-style thesaurus, style sheets, table-of-contents and macro generation, and its graphics support is a big improvement over WriteNow. WordPerfect uses a frame-based approach to graphics that is highly suited to DTP. You can anchor captions to frames, choose from a variety of border and background styles, and precisely position them on the page. Text wraps automatically around placed graphics and you can adjust the offset of the wrap.

If San Diego–based Paragon Concepts follows up on its intentions to deliver **Nisus for NeXT**, we can look forward to such features as noncontiguous text selection, drawing tools, and a full-blown macro language.

Graphics

Professional graphic designers will find nothing lacking in Adobe **Illustrator** and Altsys **Virtuoso**, while occasional artists will probably gravitate toward Appsoft **Draw** and Stone Design's **Create**.

Adobe Illustrator was one of the first programs to bring PostScript power to the user, becoming a standard tool for designers working in the emerging field of desktop publishing. With the NeXT version, Illustrator has, in a sense, come home again. Display PostScript lets you work on-screen in illustration mode, seeing the results of your changes as you make them. There's also a much greater correspondence between what appears on the MegaPixel Display and what comes streaming out of your laser printer. You can create original artwork using Illustrator's precise Bezier tools or rely on the Autotrace tool to turn scanned images into line art. Even nonartists can use Illustrator to convert any Adobe Type 1 font into an editable outline, which can be skewed, rotated, or blended to create new type effects.

Recently arrived Virtuoso is expected to provide some serious competition for Illustrator by bringing to the drawing table advanced tools for managing layers, color blending, text handling, and built-in support for the pressure-sensitive Wacom tablet. Like Illustrator, Virtuoso was also derived from a Mac program, Aldus FreeHand, but its original designers at Altsys have taken the program in new and surprising directions. Despite its power, Virtuoso is easier to use than Illustrator, particularly when it comes to freestyle drawing and applying gradient fills. Unique control over patterns, textures, and border styles puts Virtuoso over the top.

Appsoft Draw is designed for the businessperson who has to create the occasional org chart, flyer, presentation, or newsletter. But there are features, like the ability to bind text to an arbitrary path, that rival those of high-end packages. Draw's sophisticated handling of TIFF

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ONCE SCANNED, PHOTOGRAPHS CAN BE CROPPED, SCALED, AND MANIPULATED.

ILLUSTRATIONS SAVED AS EPS OR TIFF FILES CAN BE IMPORTED INTO PUBLISHED DOCUMENTS.

images, including masking and the ability to adjust brightness and contrast levels, lets you prepare scanned images like photographs for inclusion in a publication.

Stone Design's Create is a truly enabling piece of software that brings the power of PostScript effects to the novice user. Create can be used to produce dazzling display type, colorful logos, and more, using standard drawing tools and a series of interactive inspectors.

Lighthouse Design's **Diagram**, one of the first drawing programs to appear on the NeXT, is still a good choice if you frequently need to reuse elements in your layouts or prepare org charts for a company in which things are perpetually in a state of flux.

Scanning

To use photographs or video images in your document, they must be digitized with any of a variety of types of scanners.

If you work only in grayscale and do not foresee the need for color capabilities in the future, there are some excellent monochrome flatbed scanners on the NeXT market. These units, equipped with smoothly usable software, will scan in flat, reflective art like photographs and store these images as TIFF or EPS files on your hard drive. Products like the Canon **IX-30F Image Scanner** and the HSD **Scan-X Professional** are reasonably priced (from $1545 to $2195) and have plenty of resolution (typically 400 to 600 dpi) to handle most any task.

If your source images are generally color photographs, choose a color flatbed scanner like the Epson **ES300C**, the Hewlett-Packard **ScanJet IIc**, or the HSD **Scan-X Color**. A separate NeXT driver is available (and needed) for the Epson and HP models. For the Epson, get Second Glance's **ScanTastic** or Goldleaf Publishing's **eXTRASCAN**; for the ScanJet, try **Qscan** from Pixelution. Each program provides color-correction capabilities along with scanning controls. Volume shipments of color scanners have driven their prices down.

NIKON AND MICROTEK SLIDE SCANNERS ARE SUPPORTED BY NEXT SOFTWARE FROM SECOND GLANCE AND PIXELUTION.

If you already have a flatbed scanner, perhaps attached to another kind of computer, then you may only need to get a NeXTSTEP interface in order to take advantage of it on your NeXT. Interfaces are available, or in development, for the Microtek **600Z**, the Sharp **JX-600**, and the Apple **One Scanner**, among others.

A new twist on the color flatbed scanner is the Canon **CJ-10**, which provides 400-dpi color scanning, 400-dpi color bubble-jet printing, and color copying in one unit for about $10,000. Contact Goldleaf for driver software.

ALTSYS VIRTUOSO COMBINES ADVANCED ILLUSTRATION FEATURES WITH TEXT HANDLING FOR SINGLE-PAGE LAYOUTS.

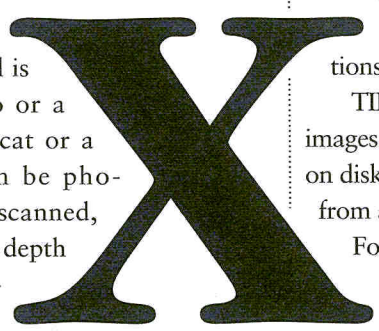
If your source material is 35mm transparencies, you will need a slide scanner rather than a flatbed. Second Glance's ScanTastic will drive the Nikon **LS3500AF**, while Pixelution's Qscan works with the Microtek **1850**.

Interfaces are also available for high-end drum scanners. Goldleaf Publishing provides

driver software for a desktop drum scanner from Howtek. If you want your NeXT to speak directly to one of the big, professional drum-scanning systems from Crosfield, DS, Hell, or Itek, you will need the **Centurlink** hardware and **ImagLink** software system from Talus Imaging.

Imaging

Often, source material is not flat like a photo or a slide. Objects like a cat or a piece of marble can be photographed and then scanned, but some of the visual depth may be lost. An overhead scanner or a CCD (charge-coupled device) camera is designed to scan in vignettes. The Photometrics **CCD Camera** system can work with a NeXT using the **Photon** interface from Dazzl. Alternatively, consider Opto-Tech GmbH's **OPTOSCAN** professional line of overhead repro scanners or Rollei **Digital ScanPack** for the Rolleiflex 6000 series of professional cameras.



ADOBE GARAMOND BOLD IS AMONG THE TYPEFACES COLLECTED BY ADOBE FOR NEXT.

You can also input live images using video-capture hardware. Metaresearch offers its monochrome **Digital Eye** or **Color Digital Eye** for this purpose. They plug into the DSP port on any model NeXT workstation. If you have invested in a NeXTcube, you can put one of its NeXTbus slots to work with a **NeXTdimension Board** from NeXT. This combination 32-bit color card and video input/output board can capture video from a wide range of sources.

Clip art

Because nearly all NeXT applications accept graphics in EPS and TIFF formats, NeXT users can take advantage of a wide variety of existing clip-art libraries. Many of these collections are on CD-ROM, so you'll need a CD-ROM drive to take full advantage of them. A few companies offer NeXT-specific collections on floppy disk.

TIFF is the preferred format for finely detailed images, but these images take up a lot of room on disk, are more difficult to modify, and suffer from a loss of quality when scaled.

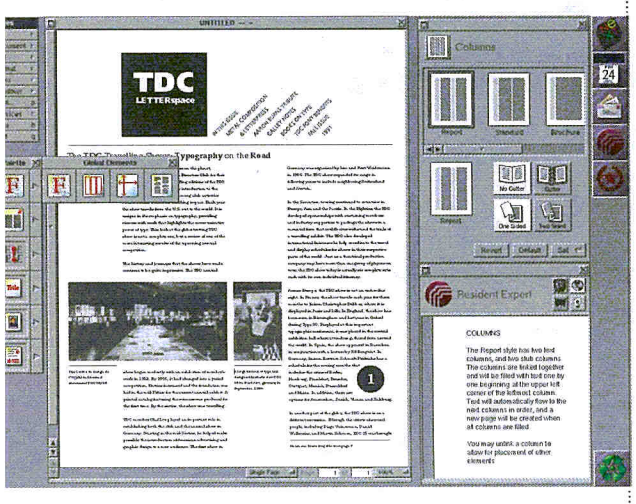
For more flexible functionality, you'll want to use EPS-format art. EPS images can be opened and modified in Illustrator or Virtuoso. T/Maker has long offered a version of its popular **ClickArt** collection for the NeXT, which includes over 400 EPS images.

Totem Graphics's **Color Clip Art** is a similar collection of 1248 images on CD-ROM. MicroMaps's **MapArt** is a more specialized collection, consisting of over 5MB of global, national, and regional maps. Point of View Computing's **Elegance** is a unique collection of border designs, decorative elements, and embellishments. And don't overlook Digital Webster, which contains hundreds of TIFF images of animals, musical instruments, and architectural elements.

Type

To give your document a professional look, you'll want to use appropriate typefaces and pay close attention to letterspacing and leading. Adobe **TouchType** helps you do this in the most intuitive way possible, by treating each letterform as a graphic that can be freely moved about on the screen. Vivid Publishing's **TypeView** provides a window into your type collection, allowing you to view the entire character set of a particular font, access an unusual character, or get information about kerning pairs.

For the fonts themselves, look for NeXT versions of the Adobe **Plus Pack** and **Type Sets 1, 2, and 3**. Other fonts from the Adobe catalog (over 1200 fonts) are available by calling authorized distributor RightBrain Software's **Font Hot Line** at 800/525-3668.



THE PAGES BY PAGES USER INTERFACE GROUPS 26 PAGE ELEMENTS UNDER SIX BASIC PALETTES.

DESIGN

Page layout

The goal of any publishing project is to bring all of the elements of a design together in a page layout on the screen. Along with the development of PostScript, it was the arrival of page-layout programs like Aldus PageMaker, QuarkXPress, and Ventura Publisher that defined the application called desktop publishing.

None of these programs is available for the NeXT, and until recently there hasn't been a good substitute for them. Now, four page-layout programs have either shipped or are in beta testing. Together with several existing document-editing programs, they make NeXT a viable publishing platform for the first time.

The first of the new NeXT page-layout programs to reach market is **Pas**
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RightBrain says that Pas
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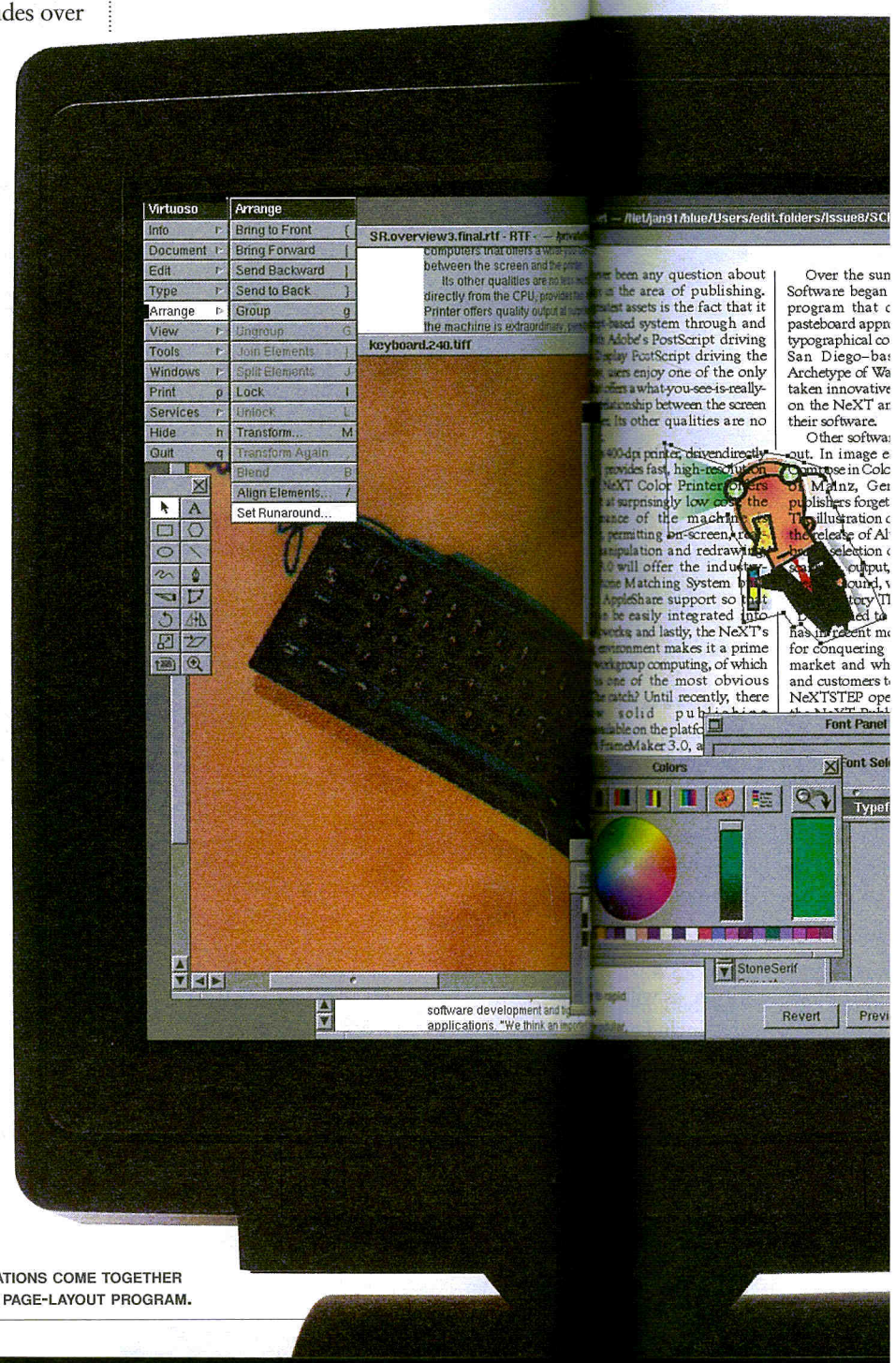

TEXT, IMAGES, AND ILLUSTRATIONS COME TOGETHER UNDER THE CONTROL OF A PAGE-LAYOUT PROGRAM.

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DESIGN

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grams to reach market is **PasteUp** from RightBrain Software. It is positioned as a general-purpose layout package, suited equally for graphics-rich professional design, corporate publishing, or general productivity.

RightBrain says that PasteUp can do anything PageMaker or XPress can do, though it may do it differently. Thus, its kerning, tracking, and type handling in general is as precise as Quark's, but it treats text like any other object, to be scaled, rotated, or skewed.

The program has won kudos for its implementation of NeXT programming principles, including direct manipulation and drag-and-drop capabilities. Not only can you drag graphics and text, but colors, attributes, and styles can be simply dropped on a page element. Selecting an object is as easy as clicking any portion of it, regardless of its layer.

Among PasteUp's other strengths are its ability to search and replace, infinite undo, and multiple views of the same document at up to 1600-percent magnification.

The flip side of PasteUp's carte-blanche approach to page design is a layout program from Pages Software, which after several years in the making is close to release under the name **Pages by Pages**. It guides users to produce well-designed business documents by limiting their choices to a preset range provided in a companion "design model."

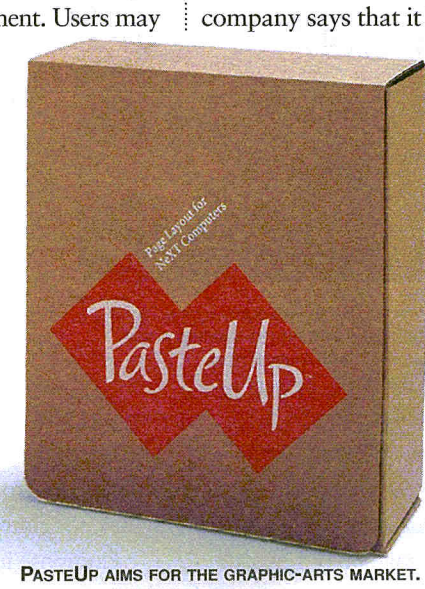
Pages by Pages will ship with seven design models, most aimed at corporate design (other models will be available separately from Pages and third parties). A separate program, the Pages Designer Edition, is used to create models.

Each model contains rules for typeface control, column layout, headline styling, and other elements that make up a page design. The idea is that an organization will use the product to standardize on a common look for all its documents. The constrained approach also allows users to create attractive designs easily, with a fairly flat learning curve.

The Pages user interface groups 26 page elements under six basic palettes. All elements are dragged and dropped on the page, and they interact appropriately. For example, a subhead will know that it lives in a column, so it scales to the column width.

Once users are comfortable with a design model, they have several ways to expand or change it. Every element has an inspector with controls to adjust the behavior of the element. Users may also alter a design model by overriding one or more rules, and then saving it as a style sheet. They can also create a design model from scratch with the Designer Edition.

Pages believes it has hit on a fundamentally new approach to page design. It is aimed squarely at business publishing, leaving the graphic-design market to other products.



PASTEUP AIMS FOR THE GRAPHIC-ARTS MARKET.

The third contestant among the new page-layout systems for the NeXT has the most interesting approach of all. The Archetype **Document Engine** is the basis for a proposed document-object standard that NeXT has tentatively endorsed as a publishing extension to its custom-application strategy. Archetype sees the engine as the basis for an explosion of modular, third-party, and custom publishing applications.

Archetype itself will publish the first program built on the Document Engine, a page-layout program it plans to market as Archetype **Page**. At this writing, few details were available about the program, which was scheduled to be shown for the first time at the Seybold Conference in September.

NEXTSTEP 3.0 SUPPORTS THE PANTONE MATCHING SYSTEM.

Archetype has developed numerous page-layout programs that have appeared under various names from publishers on other platforms. The company says that it has collected, polished, and documented its objects and is making them available for others to use.

Archetype's document-centric approach has great promise for workgroup publishing. Documents can be easily moved between applications and platforms or simultaneously shared by different users on a network.

The surprise entry in the page-layout category is Altsys **Virtuoso**. This

offspring of Aldus FreeHand on the Macintosh had always been expected to be a heavyweight in the NeXT illustration category, but earlier this year Altsys delayed Virtuoso's introduction to pursue what the company called a "strategic text initiative" to add traditional page-layout typographic capabilities to its repertoire.

Thus, it features capabilities for wraparound text, multiple columns and rows, automatic hyphenation, copyfitting, text-block linking, and full typographic controls. Many of its illustration strengths, such as allowing text on paths and color-separation tools, are boons in the page-design field.

In combining layout capability with its core illustration tools, Virtuoso is attempting to redefine the market. While layouts are confined to a single page, it excels at graphic design for advertisements, packaging, and brochures.

Long documents

As newer programs have garnered the headlines, Frame Corporation's **FrameMaker 3.0** has been quietly cranking out mountains of reports and technical documentation for early NeXT enthusiasts. Shipping since 1988, Frame's NeXT implementation is equivalent (except in user interface) to its products on 28 other platforms, according to the company. It has considerable strengths as a long-document publishing package. It also has some more prosaic shortcomings, such as lack of support for wraparound text.

FrameMaker is a comprehensive long-document processor, combining tools for word processing, table editing, page layout, graphics, and more. It is designed for corporate publishing applications, including reports, books, and technical documentation. Until now, Frame has had the NeXT layout market to itself. It will likely continue as a strong contender for the long-document segment of the market.

APPSOFT IMAGE PROVIDES A WEALTH OF FEATURES FOR PHOTO MANIPULATION AND SEPARATION.

If FrameMaker is a layout program with extensive word-processing capability, then WordPerfect, as mentioned above, is a word processor with modest designs on the page-layout market.

WordPerfect provides a basic set of page-layout tools, including the capability to wrap text around graphics, flexible column layouts, cropping, scaling, rotating, and zooming. As the standard for corporate word processing, it also provides a strong list of features for long-document publishing. Its strength will remain business documentation, but it is more than equal to the occasional simple newsletter.

Now that a wide range of software is available for desktop publishing on the NeXT, it appears that the distinct categories of word processing, page layout, and illustration software with which we are familiar are blurring. Instead, developers are providing a mixed bag of functionality to match their views of the emerging NeXT publishing market.

PRODUCTION

Prepress

In the past, the lack of prepress tools was among the most serious problems preventing the NeXT from being a complete publishing solution. Now, a broad range of products is coming to market to fill voids in the NeXT prepress universe – and proving to be some of the best available on any platform.

Prepress is the science and art of taking artwork from a computer screen and preparing it for the demands of output, whether to slide film or the printed page. It has four main elements: image manipulation, color correction, color separation, and file-format conversion.

Image-manipulation products are used for setting global values for contrast and brightness, modifying individual pixels, and converting images to printable screens. These products have literally hundreds of features and deserve a close look.

The feature list for Appsoft Image sounds like an artist's wish list: masking, joined and subtracted selections, transformations around a chosen point, anti-aliasing option on EPS files, the capability to save without alpha-channel coding, independent line-and-fill patterning, user-definable patterns and brushes, and 100 gradient stages. The inspector-based program brings all the possibilities out front, where you can find them easily but not clutter your screen.

Compose in Color from Unter Ecker Software has a full suite of manipulation tools and a background batch-processing capability. It seeks to distinguish itself through new types of tools for creative manipulation, especially those involving several different images. Chromagrafx **PixelMaster**, due by the end of the year, takes the high-end approach, aiming to give professional clients a true alternative to proprietary systems like Hell and Scitex. In addition to providing extensive image-manipulation tools, PixelMaster is designed to be fully programmable for the user. In some ways it will be an object-oriented image engine. Gemstone Systems's **Emerald Image Tool** was originally developed at TRW for analysis of satellite photos and specializes in manipulating large images using tiling and other techniques. Due to its pedigree, it promises to be packed with unusual goodies.

THE NEXT COLOR PRINTER OFFERS QUALITY OUTPUT AT A BREAKTHROUGH PRICE.

Color separation is required to produce film for the different colored inks used in the physical printing process. Several of the image-processing applications described above, including Image and PixelMaster, will output separations, as will some illustration and layout programs, including PasteUp, Virtuoso, and Illustrator. Products from Goldleaf Publishing, described below, provide both separation and color correction.

Making sure final color output or printing looks as expected has always been a big issue in publishing. This is made doubly hard because color on computer monitor (light comes from behind) v printed page is reflective (lig

Prior to September, ther this problem on the NEXT. lishing has introduced **eXTE COLOR** for the physical cal with output devices and the images. CAL includes a phy taches either to your monito contains a color you want. I ments into the CAL softwar are creating can match it ex application that works menu. It takes an ex rects it for the ou choice. If you screen to apj printed using and coated stock your electronic file tions for the desired re File-format sary because dif support differ **ner** from IPT Systems's Ga matic file co to a Macinto The most vers version products, hov cian from Bäcchus. This S ware supports 16 different f of platforms. It also has the an image's attributes, like co the image to the exact specif your output device.

Output

It is impossible to overestim of output. After all, it is the for anyone who doesn't ha which to view the pages. A lication process has often le Macintosh and its highly d output devices. But this is c NeXT's output options nov branded printers, other con imagesetters, and film reco

One of the core issues the potential of the NEXT Script processing. Printers c (raster image processor), w where from a few thousanc as $30,000. Another consic

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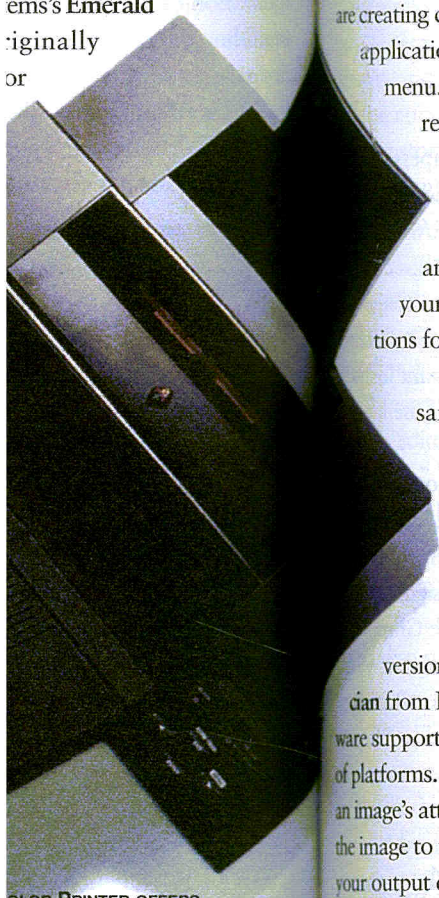

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color on computer monitors is transmissive (light comes from behind) while color on the printed page is reflective (light bounces off of it).

Prior to September, there were no solutions to this problem on the NEXT. Now, Goldleaf Publishing has introduced **eXTRACAL** and **eXTRACOLOR** for the physical calibration of monitors with output devices and the color correction of images. CAL includes a physical device that attaches either to your monitor or to any object that contains a color you want. It reads color measurements into the CAL software, so the image you are creating can match it exactly. COLOR is an application that works from the Services menu. It takes an existing image and corrects it for the output device of your choice. If you want a color on your screen to appear the same as when printed using a four-color press and coated stock, COLOR will tweak your electronic file and produce separations for the desired result.

File-format conversion is necessary because different programs support different file types. **Partner** from IPT and the Cayman Systems's **GatorBox** provide automatic file conversion for output to a Macintosh-based printer.

The most versatile of the file-conversion products, however, is **PixelMagician** from Bäcchus. This Swiss-Army-knife software supports 16 different formats, from a variety of platforms. It also has the capability to change an image's attributes, like color-bit depth, to tweak the image to the exact specifications needed by your output device.

Output

It is impossible to overestimate the importance of output. After all, it is the only way to publish for anyone who doesn't have a computer with which to view the pages. After prepress, the publication process has often left the NeXT for the Macintosh and its highly developed range of output devices. But this is changing rapidly, as NeXT's output options now include NeXT-branded printers, other companies' printers, imagesetters, and film recorders.

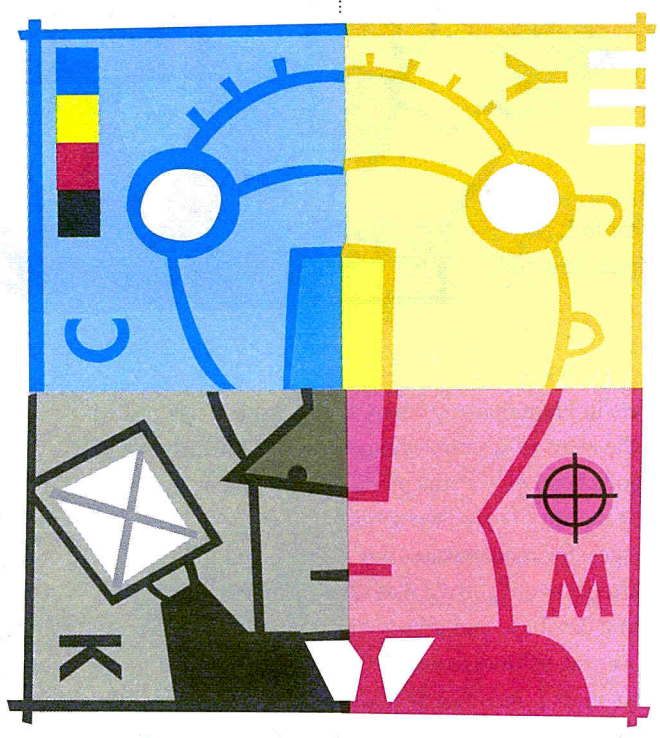
One of the core issues with NeXT output is the potential of the NEXT to do its own PostScript processing. Printers don't then need a RIP (raster image processor), which can cost anywhere from a few thousand dollars to as much as $30,000. Another consideration is how fast the NeXT can feed its data to the printer, ranging from the fast dedicated NeXT printer port to the slow serial port. Licensing issues with Adobe Systems, which requires separate licensing agreements for PostScript output over 900 dpi, still need to be resolved.

At the head of the ouput list are the primary NeXT devices, the **NeXT Laser Printer** and **NeXT Color Printer**. Both benefit from a fast connection to the NeXT and the use of the CPU as a RIP. At $1795, the 400-dpi black-and-white printer is an excellent value for a variety of final and preliminary printing tasks. Though not appropriate for publication-quality output, the $3495 color printer fits the bill for presentation graphics and color proofing.

Of course, virtually any PostScript printer can be connected to the NeXT, but you have to buy a RIP, and the connection via serial lines is often slow. It would be impossible to list the full range of PostScript devices, but those that cater to the NeXT market include thermal-wax color printers from Océ and Tektronix.

To connect to a variety of low-end, inexpensive printers, Federico Heinz Consulting offers **Dots**. For those users with an Epson dot-matrix device, like the HP LaserJet or IBM Proprinter line, for example, Dots lets you salvage something from your old PC system. For connecting to Macintosh-compatible printers, IPT's Partner lets you put the NeXT on a Mac network and access any of its printing devices directly.

To get the higher-resolution output needed for professional-looking publications, a growing number of service bureaus provide direct support for NeXT. Most do not, however, in part because of the unavailability of the entire Adobe Type 1 library for NeXT. The alternative is to transfer your NeXT file to a Mac disk and send that to the service bureau.



COLOR PAGES ARE SEPARATED INTO CYAN, YELLOW, MAGENTA, AND BLACK LAYERS FOR OUTPUT TO FILM.

Imagesetters are high-resolution output devices that print to either photographic paper or film. The two leading manufacturers, Linotype/Hell and Agfa, both sell a range of products in the NeXT market. For the most part, these products still require an external RIP. But Goldleaf's **eXTRASET** connects the NeXT via the SCSI port to Linotype/Hell's Ultrix line of imagesetters.

Film recorders allow users to produce high-quality slides directly from the NeXT and offer great savings over service bureaus. Talus remains the most aggressive player in the film-recorder market, selling its stylish **T1 Film Recorder** and **ImageMate** software, which use the NeXT as a RIP. Agfa markets a full line of film recorders that require an external RIP.

In a class of its own is the Canon Laser Copier (CLC). This is the Cadillac of full-color output and the best available equipment short of a printing press. The CLC is a key component of the Color **PowerStation** that Canon is preparing to ship. The package will include a CLC 500, a NeXT Turbo Color machine, an IPU-10 (Image Processing Unit), and specialized software. The price tag is upwards of $100,000. Among the system's key qualities are intelligent job-tracking for billing puposes and optional support for the CLC as a high-end color scanner. The entire PowerStation can also be dropped into a Mac network as a high-end print server, with the NeXT serving as the PostScript RIP.

The output market is getting crowded and complex, but the presence of big players such as Canon, Agfa, and Linotype is a strong indication that the NeXT has finally arrived as a publishing platform with a bright future.

"Tools of the Trade" was compiled by Dan Ruby, Dan Lavin, Rick Reynolds, Lee Sherman, and Kristin Dyer.

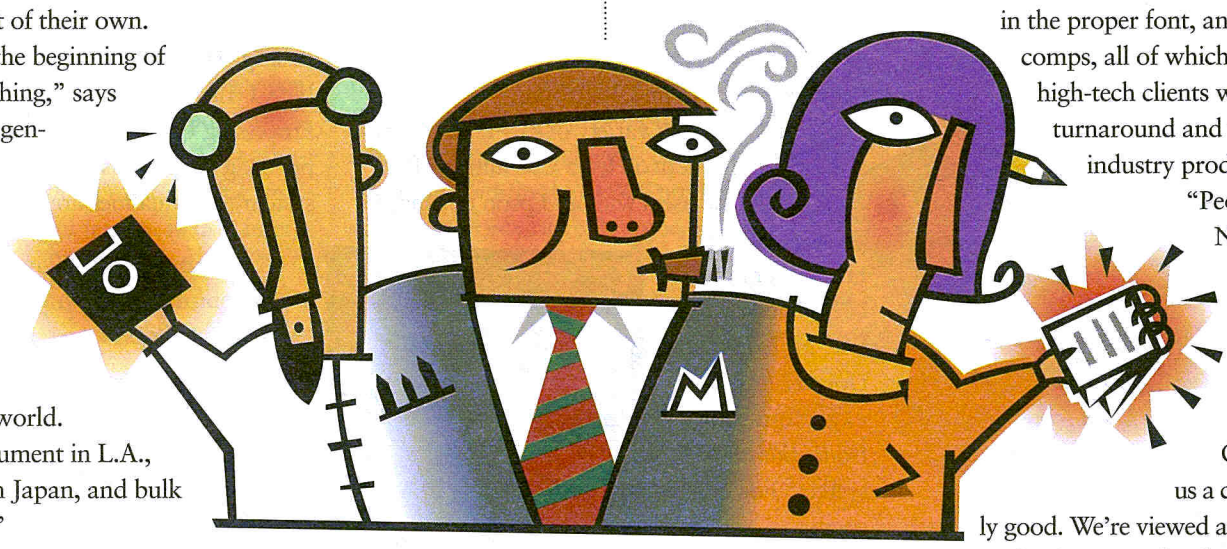
Worth the Wait?

PROFESSIONAL DESIGNERS WILL HAVE TO DEFINE THE NeXT DTP MARKET: SHRINKWRAPPED OR MODULAR

BY ELIOT BERGSON

For design professionals who took the plunge and chose the NeXT years ago as their publishing platform, the recent appearance of shrinkwrapped DTP applications is both a blessing and a reminder that more is needed. For others, the answer is to mix and match NeXT application capabilities, system enhancements, and development tools – to build a modular publishing environment of their own.

"We're seeing the beginning of 'just-in-time' publishing," says Les Krzyzanowski, general manager in Los Angeles for Crestec, an international documentation concern with NeXTs in several offices around the world. "I can access a document in L.A., have it translated in Japan, and bulk printed in Taiwan."



Custom environments

At Crestec's headquarters in Hamamatsu, Japan, Hugh Ashton has placed 25 NeXT machines at the heart of his publishing network. An early NeXT enthusiast, the British-born head of systems project development oversees the publication each month of up to ten service and owner's manuals, in seven different languages, for motorcycles, typewriters, and marine engines. Ashton has written custom software to take formatted chunks of manuals he has stored in a database and import them into FrameMaker.

He is unifying his printing solution as well. Crestec has installed three Xerox DocuTech printers in its L.A. office and is working on custom software to drive the new direct-digital printer, which uses a Kurzweil scanner to compress data at 600 dpi, instead of a light-sensitive camera, and can act as scanner, output device, and copier. "We can get customers to abandon offset for short print runs," says Ashton.

This type of "custom publishing environment" fits in precisely with NeXT's vision of publishing on the platform, according to Dave LaDuke, manager of publishing markets. It supports NeXT's overall marketing strategy of mission-critical custom apps. And because printing and publishing will increasingly rely on heterogeneous networks of high-tech machinery, says LaDuke, "we'd like to be in the middle of a mixed environment to run prepress – file management, queue management, PostScript-error checking, high-resolution image replacement, compression, networking, billing."

And with the emergence of third-party modular solutions and shrinkwrapped apps, NeXT is concentrating on assuring that software integrates into publishing environments as seamlessly as any hardware might.

A headache in disguise

"With the NeXT, I can play with design as if I had a pile of papers on the table – windows on the desktop – to go wild with," says Eddie Lee, a designer at Square Two in San Francisco. The machine has allowed him to try different ideas far more quickly than he could on a Mac, greek text in the proper font, and scan images on comps, all of which help him secure high-tech clients who want faster turnaround and use of the latest industry products.

"People love the NeXT," says Sheila Henriques, a designer at Outline Graphic Design in Vancouver, British Columbia. "It gives us a chance to look really good. We're viewed as a professional studio that's in it for the long haul."

But enthusiasm is tempered by reality. Lee points to the need for a universal separation program and an image-editing program like Photoshop. While waiting for these gaps to be filled, he ports work over to the Mac. Henriques says she has art suppliers or a printing house add special effects.

Both are also frustrated by the lack of service-bureau support for NeXT files. "I can design until the sun goes down, but if I can't go to a service bureau and get four sheets separated, it's maddening," says Lee.

Andrew Vyrros, design director for several early issues of the *BANG Newsletter*, says he "had to do lots of reality checks on the output to make sure everything was all right." Vyrros encountered font-downloading conflicts, disappearing disk space as images swelled the NeXT-generated swapfile, and PostScript incompatibilities between the NeXT and RIPs – even at bureaus that had GatorBox connections to Mac networks.

Designers see the appearance of software like Adobe Illustrator, Appsoft Draw, and Altsys Virtuoso as a validation to go with the NeXT but feel that additional shrinkwrapped apps will lead to wider acceptance of the platform and more service-bureau support. "As tools become available, the NeXT will become much more attractive for desktop publishing," says Vyros. "In the long run, it will be the superior platform."

Crafting succes

Sergij Fŏski knows what it's
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ADOBE SYSTEMS
Illustrator $695
TouchType $249
Adobe Type Library $95–$370
415/961-4400, 800/833-6687

ALTSYS
Virtuoso $695
214/680-2060

APPLE
Apple One Scanner $1299
800/776-2333

APPSOFT
Draw $399, Image $995
WriteNow $199
415/802-2900

ARCHETYPE
Document Engine $49
Page $795
617/890-7544

BÄCCHUS
Pixel Magician $199
310/820-9145

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Crafting success

Sergij Fŏski knows what it's like to try and sell a platform that lacks publishing software as a publishing solution. With Victor Husary, his partner at Skeleton Crew USA, a system integrator in San Francisco, he has forged a deal to bring 100 NeXTs to Lubljana, Slovenia.

"[The client] wanted to go with something more 'stable' and get a few NeXTs," says Fŏski. "There's another company in Lubljana that has 30 Macs. They have to kick their RIP to work, run around with disks, troubleshoot a broken network. I told them they didn't want that."

The deal involves a $4.2 million loan from the International Finance Corporation, an affiliate of the World Bank, to remodel the editorial and publishing system of the Delo Group, Slovenia's largest publisher. When changes are complete at the national daily paper, local daily, and 12 magazines, Skeleton Crew hopes to secure more funding to revamp Delo's reproduction house and printing plant.

The editorial system will rely on RightBrain's PasteUp as the DTP tool, a custom redmark system for editor/author interaction, and custom news-feed-capture software to grab wire-service text and images and distribute them within the system.

In an attempt to keep user acceptance as high as possible, Fŏski is writing code for the redmark software to drive old Linotype typesetting machines still in place. He is also writing a Slovenian version of the software that will contain hooks to other Delo software.

"Programmers know PostScript but they have to think like typographers or editors. You have to port the knowledge of each craft to desktop publishing," Fŏski says.

NeXT's LaDuke acknowledges that there is "a lot of intelligence of craft out there, but the economics of the market haven't allowed shrinkwrapped-app developers to bring it to market. That's why modular development is very important, so people can develop the small stuff and get it linked to what's already out there."

Users might very well be trapped between their own craft requirements and developers' market needs, but the middle ground may prove fertile: Users will have a unique chance to drive this emerging market. Because not all sites can afford systems integrators like Skeleton Crew, developers will be forced to work on shrinkwrapped solutions at the expense of modular solutions, according to Bruce Webster, chief technical officer of Pages Software in San Diego. "No one at NeXT has really made a compelling case for the Objects-R-Us methodology," he says.

A better solution, Webster says, will be the publication of agreed-upon API standards, so developers all speak the same language. Users will be assured a high degree of functionality in shrinkwrapped apps, a friendly learning curve for customization, and interapplication communication.

This could prove to be a winning strategy. "We could have lots of headaches communicating between third-party apps. We'll pick ones that allow us to integrate them with others," says Skeleton Crew's Fŏski.

More than just good looks

Some users, like Sheila Henriques, have professional concerns that NeXT never dreamed of when it built the first Cube. "The aesthetics of the machine help us because clients expect this look from design studios. We sell image and they want image," she says.

But others know that, in the end, it's not just how the NeXT looks, but how it allows a craftperson to achieve his or her goals. Whether the DTP solution on the NeXT is primarily modular or shrinkwrapped, "it comes down to this," says Sergij Fŏski: "There are old guys who have to learn the system and accept it. You can put a NeXT on their desks, but they have to use it. If they push the keyboard away, you lose."

ELIOT BERGSON *is associate editor at* NeXTWORLD. *He was a typesetter for eight years.*

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ERGO STYLE

The fix is in for NeXT's much-maligned keyboard and mouse

☆ ☆ ☆

BY DAN LAVIN

You can never tell in what size or shape innovation will come. For NeXT users, the latest in computer design is a curvy new keyboard and puckish mouse.

Beyond their ergonomic design, the new peripherals are important because they conform to the Apple Desktop Bus (ADB) standard for connecting input devices. While NeXT does not yet fully support all ADB devices, it may do so in the future. This will open up the whole world of alternative keyboards, mice, and graphics tablets to the previously closed NeXT system. The downside is that these new goodies will be available, at least for the time being, only to new purchasers of Turbo Color systems and a few hardy souls willing to pay for a relatively expensive upgrade from older color systems.

The new devices are the answer to complaints from users that NeXT's keyboard and mouse were the weakest elements of an otherwise elegant computer system. While NeXT's MegaPixel Display and CPU enclosures have been celebrated for their innovative industrial design, the original keyboard and mouse looked and performed like off-the-shelf components for a run-of-the-mill computer. In fact, sources involved in the initial design process confirm that the keyboard and mouse were compromises left to be fixed at a later date.

☆ ☆ ☆

Low profile

The new keyboard is completely redesigned. It is smaller, with about one-half inch shaved from each dimension. It is also nearly a pound lighter. This all makes for a sleeker board that can be more easily held in the lap. "The old keyboard was more like a tank. This one is a sports car," says hardware product manager Wayne Goodrich.

But outside dimensions are just part of the story. The keys stand up much taller from the base, which is itself concave in shape rather than flat, like the older model. While the old board could be adjusted only by adding rubber feet, the new one has a tilt bar in the back that adjusts to four possible positions. The keycaps are more sculptured and fit the fingers better. And key action represents a major change: The keys are now softer to the touch because NeXT replaced the keyboard's underlying metal springs with rubber domes.

Placement of the keys has changed significantly. The most innovative feature is the replacement of the two Command keys with a long Command bar running below the space bar. This should be a welcome addition for power users who prefer using command-key equivalents to mouse-driven menu commands, though the greater distance from the Command bar to the top row of keys may prove to be an irritant for some users.

The places vacated by the Command keys are now filled by two Help keys, which activate NeXTSTEP 3.0's new systemwide Help system. Hitting these keys turns the cursor into a question mark. By clicking any item on the screen with this Help cursor, a window pops up containing context-sensitive information. A check box in the Preferences application allows users to switch the functions of the Command bar and Help keys.

The Power, sound, and brightness keys are much smaller and are recessed into the keyboard, to prevent accidental pressing. The Alternate keys have been moved toward the center and a new Caps Lock key has been added.

One of the major complaints about the old keyboard – the placement

of special keys for UNIX ch
of the pipe (|) and backslash
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1 Buttons to adjust variable height

2 Recessed sound and brightness buttons

3 Command bar

4 Help keys

5 Sculpted keys

PHOTOGRAPHS BY STUART WATSON

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l keyboard – the placement

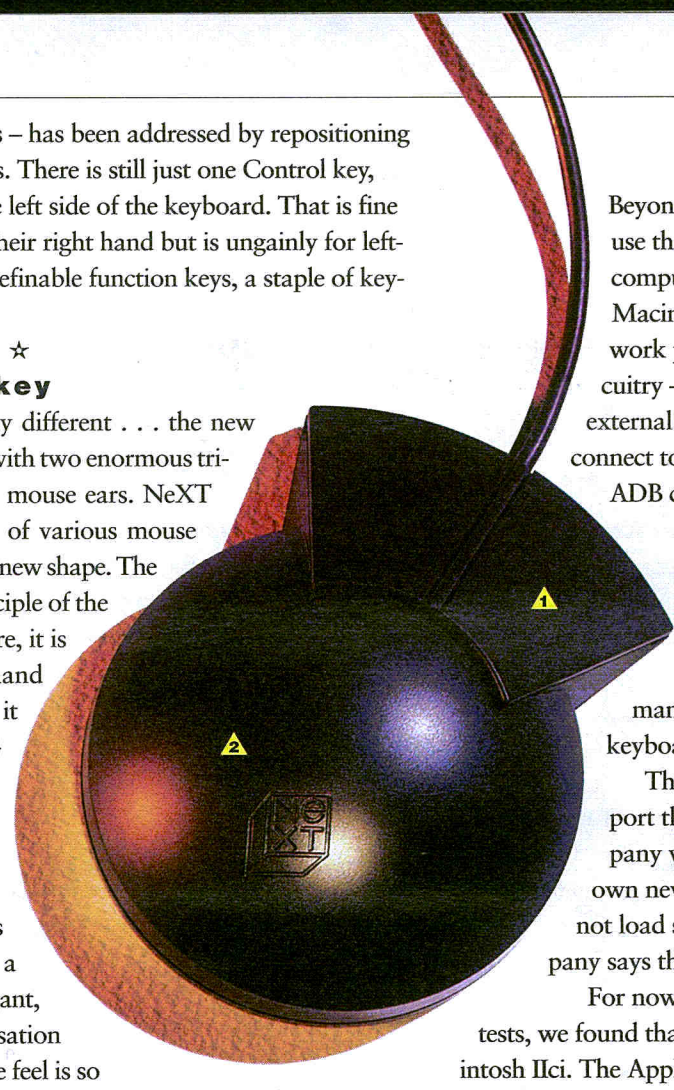
of special keys for UNIX characters – has been addressed by repositioning of the pipe (|) and backslash (\) keys. There is still just one Control key, however, in its familiar place on the left side of the keyboard. That is fine for users who use the mouse with their right hand but is ungainly for lefties. Also still missing are any user-definable function keys, a staple of keyboards for other platforms.

☆ ☆ ☆

Air hockey

And now for something completely different . . . the new mouse is round and dome-shaped, with two enormous triangular buttons that resemble real mouse ears. NeXT conducted extensive usability tests of various mouse designs before settling on this radical new shape. The company says that the guiding principle of the mouse is fingertip control. Therefore, it is designed to be guided with the hand rather than grasped by it. Though it is larger by dimension, at just 4 ounces it is 40 percent lighter than the old mouse.

Like the old design, the new mouse operates by mechanical action, but NeXT claims that it has twice the sensitivity. While it is a stretch to call the design sleek or elegant, it molds easily to the hand. The sensation is much like playing air hockey. The feel is so smooth that it could easily be marketed as a third-party mouse for Macintosh and Windows, if NeXT were so inclined.



1 Dual buttons
2 Push rather than grab; dome shape molds to hand

☆ ☆ ☆

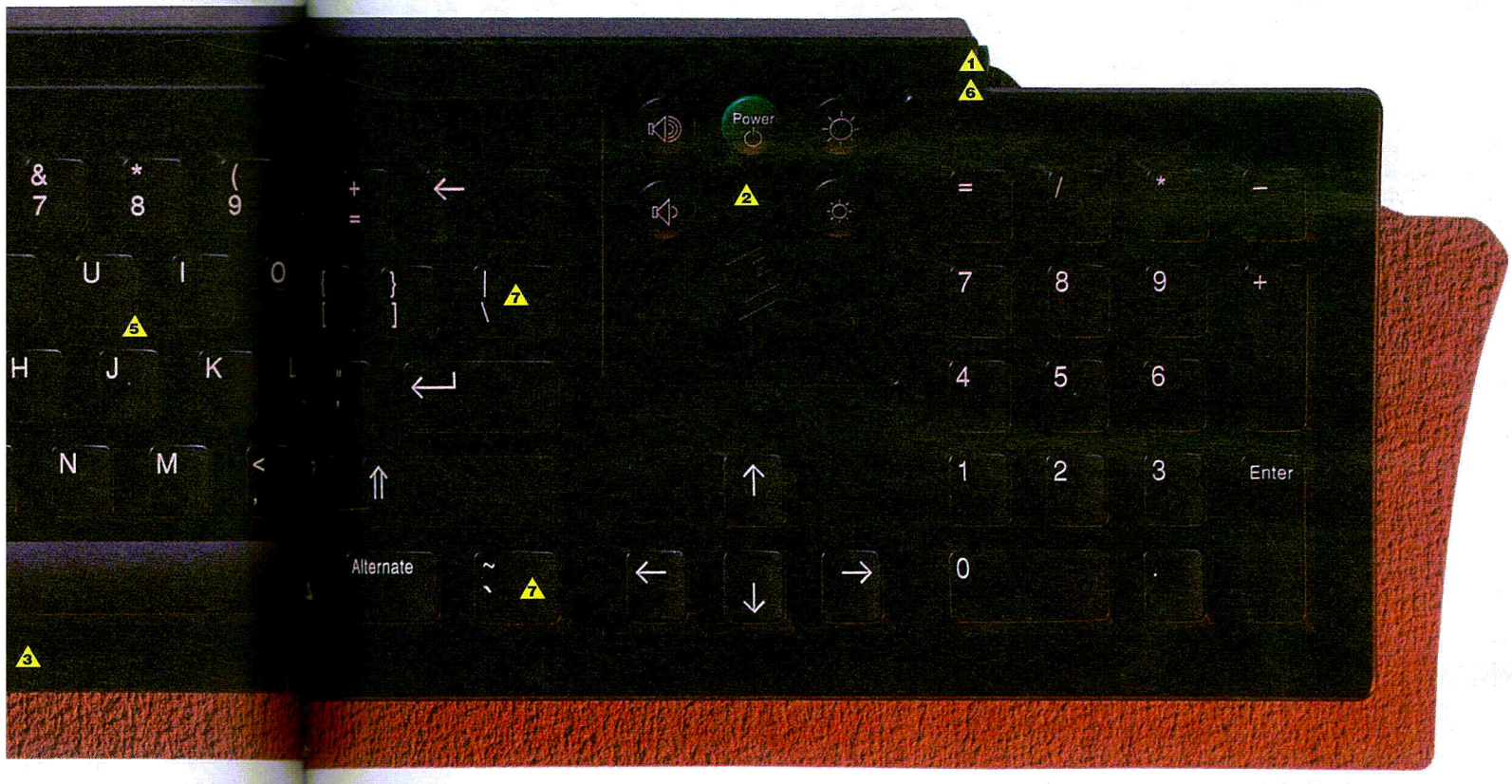
On the bus

Beyond the cosmetic changes, the new mouse and keyboard use the ADB standard as their electronic connection to the computer. NeXT says that due to the enormous volume of Macintosh parts that are produced, the ADB electronics work just as well and cost far less than NeXT's own circuitry – and users get a keyboard that has more expensive external components for the same price. The ADB devices connect to the NeXT system through a new Sound Box with ADB connectors.

According to the *Apple Macintosh Family Hardware Reference*, ADB was designed to be a general-purpose, low-speed serial bus. Multiple input devices can be daisy-chained on the bus. Also, because ADB is a standard specification, third-party manufacturers are able to write drivers for alternative keyboards, mice, and other input devices.

That's the theory. In practice, NeXT does not yet support the ADB application-program interface, so the company will not guarantee that input devices other than its own new keyboard and mouse will work. For now, users cannot load special device drivers into the NeXT, though the company says this will change in the future.

For now, third-party devices may or may not work. In limited tests, we found that the NeXT keyboard and mouse worked on a Macintosh IIci. The Apple keyboard and mouse worked on the NeXT, though there was of course no way to turn the computer on and off or control brightness and volume. A sample third-party input device, CoStar Corporation's Stingray trackball, worked admirably. We were able to daisy-chain



mand bar
4 Help keys
5 Sculpted keys
6 ADB ports
7 UNIX keys

PHOTOGRAPHS BY STUART WATSON

multiple devices, although the mouse had to be the last device, since it has only one ADB connector.

In general, it appears that any device that works on a Mac without driver software will also work on the NeXT. That includes a variety of trackballs, mice, and some types of tablets. More exotic devices probably will not work. Be sure to test before you buy.

In one last change to its standard components, NeXT is changing the scan rate on color monitors, from 68MHz to 72MHz. This makes the monitor conform to European standards but results in a slight shift of the screen for users of the 17-inch Fimi monitor. These users can live with the offset or get a monitor adjustment by an authorized service center (the cost, if any, is undetermined). NeXT says that the higher scan rate makes the screen marginally easier on the eyes.

The old 21-inch Hitachi color monitor will not need adjusting at all. New systems will be sold with a new monitor supplied by Sony. We haven't seen it yet but will report on it in a future issue.

☆ ☆ ☆

Limited upgrades

As good as the new components are, only some NeXT users will be lucky enough to be able to use them. Buyers of new NeXTstation Turbo Color machines will get them as standard equipment. In fact, they won't have a choice, since the new Sound Boxes that will ship with these systems will have connectors only for ADB.

For existing owners, it depends on which model of NeXT computer they own. Since the new components connect through the Sound Box, all black-and-white slabs and all Cubes (including NeXTdimensions) are out. Sorry, Charlie.

Owners of older Turbo Color machines will be able to upgrade by having a new ROM installed in their slabs. They will also need a new Sound Box ($125) and a Starting Point Kit with the new keyboard and mouse ($225). A sensing pin in the color cable automatically adjusts the system to the components being used. NeXT has been shipping the cable with the sensing pin since late spring. If you have an older cable, you will need a new one.

If you have something other than a Turbo Color system, you must first upgrade to a Turbo motherboard and then make the upgrade described above. Prices for the ROM and Turbo motherboard upgrades were not determined at press time.

Is it fair that only new or recent buyers of NeXT computers will have access to the latest and greatest hardware? Probably not. The best advice for users with keyboard envy may be to trade down their old systems to the new users in their organizations while the true believers do their computing in ergonomic style.

DAN LAVIN *is a senior editor at* NEXTWORLD. *He can be reached at dlavin@nextworld.com.*

Finger Exercises

My problems with Repetitive Stress Injury (RSI) started at NeXT Developer Camp. By the fourth day, my left wrist felt like a piece of surgically implanted corrugated aluminum. My fingers felt like pins and needles. My tendons felt like tightropes.

Does the root of my ailment lie with NeXT's old keyboard? Probably not. "People are suffering RSI from using all kinds of keyboards," says Jane Fulton, a human factors consultant at IDEO Product Development, which worked with NeXT to design the new keyboard. The NeXT keyboard "wasn't any worse than any other keyboard on the market," she adds.

Still, everything can be made better. When NeXT contacted IDEO to help design its new keyboard, the first thing the company did was interview a dozen users, then videotape six of them typing away at NeXTstations for hours. The results of the studies showed four main points:

☆ Despite the fact that the old keyboard had two Command keys, their position – on either side of the space bar – made it awkard to type command-key equivalents.

☆ Users frequently had to overextend their fingers to reach the backslash(\), vertical bar (|), backquote (`), and tilde (~) keys on the keypad.

☆ People were nervous about accidentally hitting the volume, brightness, and Power controls, and altered their typing because of the position of these keys.

☆ The size and shape of the mouse was causing finger strain.

"A lot of NeXT users are power users," says Bill Verplank, the lead human factors engineer at IDEO. "They use the Command keys and the Control key. They don't use the mouse all the time."

Making things better

My personal complaint with NeXT's old keyboard was its feel. The keys had a lot of resistance at the top of their travel but virtually no resistance at the bottom. The result: After my fingers overcame the initial resistance and started moving down, they crashed into the backstop – transmitting repeated trauma up my fingers and into my hand. NeXT's new keyboard solves this problem by using conductive rubber in its switch technology.

Another problem with NeXT's old keyboard was the tilt. You could use it in a flat position or put on the rubber feet for a tilt of roughly 15 degrees. The new keyboard allows four different tilt positions, and it only takes a moment to change from one to another. That's important, because ergonomics experts say that changing your position on a regular basis is almost as important as having a good position from which to start.

Of course, the biggest change with the new keyboard is the Command bar, located beneath the space bar. The idea, says Verplank, is to make it easier for people to type command-key combinations. With both the old and the new keyboards, people tend to press either Command key with a thumb. But with the new keyboard, "people twist their wrist less," says Verplank, who adds that IDEO is applying for a patent on the invention.

But how does it feel?

I felt an immediate difference within the first ten minutes of using the new keyboard. I suffered none of the usual needles of pain shooting up my fingers. Using the Command bar felt natural after another five minutes, although I still mistake it for the space bar from time to time.

The mouse also felt better. It forms a "V" between its body and buttons; this spot gave me a comfortable place to rest my fingers and control the mouse's movement.

The new NeXT keyboard and mouse may have the best ergonomic design on the market. But it is important to remember that no keyboard, no matter how well it is designed, will let you type 20 hours a day for two years without problems. Still, if I'm going to be using a NeXT keyboard, I'd rather use the new one than the old one.

by SIMSON GARFINKEL

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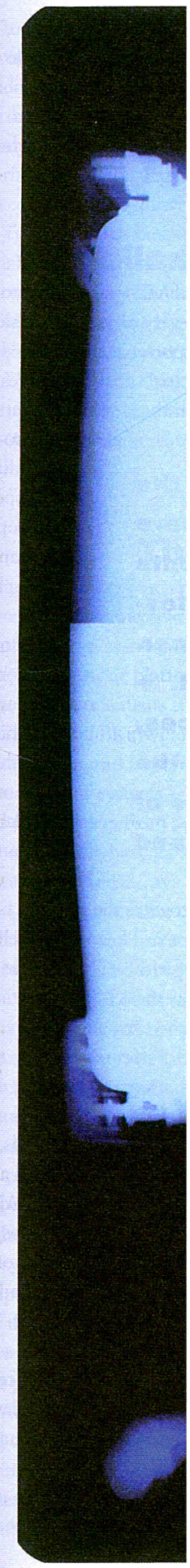
Clinical Trials

LEADING-EDGE HOSPITALS ARE ADMITTING NeXT FOR PATIENT RECORDS AND MEDICAL IMAGING

BY KRISTIN DYER

Imagine a small community hospital in a tree-lined Detroit suburb, and you might think of bake sales and volunteer candy stripers – more "General Hospital" than "St. Elsewhere." What you might not expect is a computer room on the sixth floor filled with networked NeXT workstations. + Yet Mt. Clemens General Hospital is on the leading edge when it comes to administrative medical technology. The hospital has tabbed NeXT for its plan to cut costs and improve patient care by developing its own in-house medical-records system. The first phase, with 100 NeXT machines used for administration and admitting, will go online in January of 1993. + "We think we are unique in our comprehensive strategy," says Vimal Chowdry, CFO of Mt. Clemens Hospital. "We're developing a system internally and it is very cost effective. The total budget, including NeXTstations, is less than buying a text-based system with dumb terminals." + As politicians and economists debate proposals for affordable health care in this election year, a growing cadre of far-sighted medical technologists have turned to NeXT as part of the solution. But medicine is not a market NeXT cultivated. "The way we found them is that they found us," said Steve Jobs at NeXTWORLD Expo in January. + Hospitals have a unique set of priorities. They need a competitive advantage in an increasingly tight market, but patient care must remain their primary consideration. The medical professionals who have decided to go with NeXT systems are convinced that the combination of its graphical user interface and powerful UNIX operating system will serve both requirements equally. + Third-party developers and major customers believe the NeXT will not only beat current mainframe systems in speed and connectivity, but that its object-oriented programming environment will permit painless adjustments to new and changing standards without systems being rewritten or administrative costs going up. The biggest area for increased productivity is patient records, but the NeXT is also finding uses in imaging and diagnostics.



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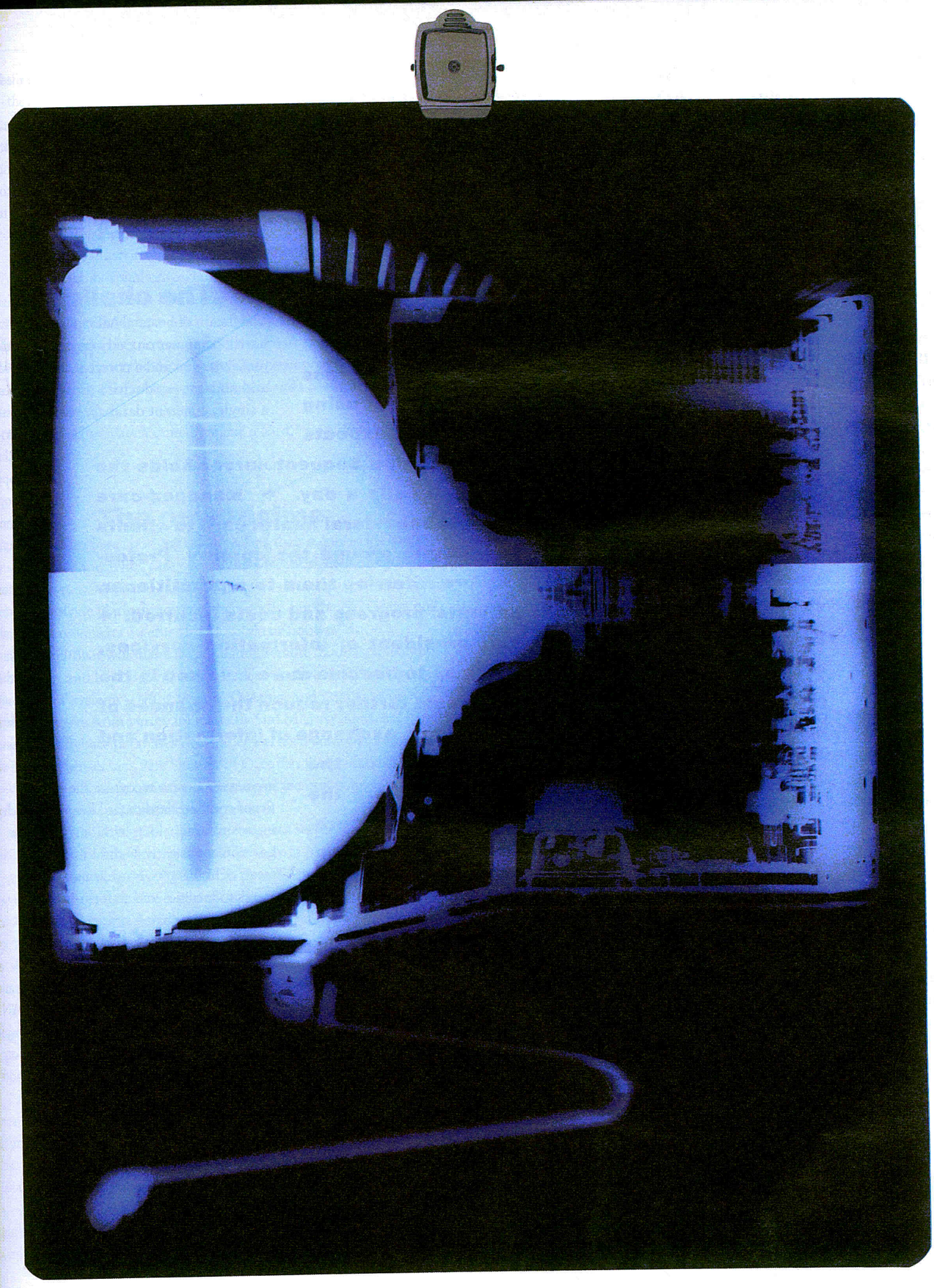

The players

Besides Mt. Clemens, four major groups are developing medical-information systems on NeXT machines. Each is unique in its approach and requirements.

Glen Carbon Corporation, Champaign, Illinois: Emergency-room physician Rick Pionkowsky got so interested in the challenge of designing an interface that would appeal to doctors that he went back to school and got a master's in computer science. Once he saw a NeXT, he believed such an interface was possible. Glen Carbon's modular system will go into beta testing soon in the osteopathic hospital at Rush University/St. John's Medical Center in Chicago.

Logibec, Île des Soeurs, Quebec, Canada: This database corporation has been in the business of medical-records systems for over ten years, using relational databases such as Progress and Sybase. It also developed DB Toolkit for the NeXT, an SQL-oriented precursor of NeXT's own DBKit. Logibec's NeXT-based system, called Clinibase, is beta testing at the Alberta Children's Hospital in Calgary. The software's bilingual interface and documentation is expected to give the company an edge in the Europe market.

Oceania Health Care Systems, Palo Alto, California: Two emergency-room doctors, a retired medical professor, and one savvy businessman have set out to create a system that organizes medical records like their paper counterparts. The beta site, San Diego Hospice, went on-line in August with 40 computers for administrative use. Oceania also has plans to involve portable computers for clinical use.

Tecor, Santa Cruz, California: Steve Hurwitz spent five years creating medical software on the Macintosh and Sun workstations as part of his medical-consulting firm's work. His last consulting client needed a custom program combining medical records and accounting features. The NeXT-based system he developed to meet their needs provided the foundation for a new company that is spawning beta sites in Chicago, Saudi Arabia, and Spokane, Washington.

NeXT itself has recognized that health care represents an important market opportunity. Early this year, the company held a conference for medical developers to discuss the issue of standards and compatibility between medical applications. Over 92 people attended from 36 medical-development firms.

"The first thing for them to realize was that they weren't alone," said Ken Rosen, NeXT's manager for emerging markets. And while most participants expressed an interest in compatibility between their products, no one has made the first move; each company intends to fulfill its own vision of medical-record systems before attempting integration.

Preferred Health Care (PHC), which provides mental-health and substance-abuse hot-line services to almost 70 Fortune 500 companies across the nation, is currently using 115 NeXTstations and expects to buy as many as 1000 more. Sybase on a Sequent server holds the client data-base; staff handle 12,000 calls a day. + Managed-care providers like PHC reduce the cost of behavioral health care to clients by contracting rates with practitioners around the country. Professionals assess callers' needs before referring them to a practitioner. The central database tracks patients' progress and costs incurred. + Estal A. Fain, PHC's senior vice-president of information services, believes that computers will continue to become more involved in the process. He says diagnostic tools could further reduce the chances of poor medical treatment, while electronic exchange of information and claims could cut back on the paper trail. "NeXT offers the best set of object-oriented programming tools out there today and the cost of moving development to NeXT is about half that of PCs," according to Fain.

The challenge

The dream of hospital MIS managers is to have a computer on every physician's desk and nurse's station and a portable at every bedside and under every doctor's arm – all accessing a single, coherent database that is constantly kept up-to-date. With the recent appearance of sophisticated hand-held computers and improved wireless communications, reality may not be far behind.

But the world of medicine is alarmingly arcane. Hospitals were among the first to recognize the possible benefits of computerized record keeping, purchasing mainframes along with banks and the government as early as the 1940s. Lean times mean tight budgets, however, and improvements to facilities and staff provide more tangible advantages than a system upgrade or new hardware. Nowadays, few U.S. hospitals are without a collection of mainframes, minis, and micros. But they are hopelessly outdated and disorganized. They've been wired and rewired with a spaghetti of LANs, and few systems work well with each other, even within the same hospital.

The other main hurdle in the medical field is what Brian Rosen of VISUS, a Pittsburgh-based NeXTSTEP developer, calls the "fiddle-faddle factor": "If doctors can't figure it out in five to ten minutes, forget it." Most of today's systems require days, not minutes, of training. And as any business that maintains data knows, it doesn't matter how easy it is to get the information out if it doesn't get entered in the first place. Most developers working in this field agree that a choice of interface style is crucial if the systems are to adapt to physicians' personal idiosyncracies.

Under the current system, data-entry clerks type about 700 two-minute phone messages about patient status, medications, or tests into the hospital's records system ev
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It doesn't work very well: Few doctors call promptly after an examination, which means delays in updating a patient's record. A specialist called in for consultation may mistakenly order tests the patient had an hour before, or prescribe medication that reacts with what the patient is already taking. But so far, leaving voice messages on the hospital's computerized answering machine is a hospital's best bet, because doctors can't read each others' handwriting any better than anyone else can.

Typically, each hospital office, lab, and pharmacy has its own, highly specialized computer system. Each system must be separately logged in to and out of, one at a time, from a terminal at the nurse's station. There's no simple way to see the big picture: a complete record of each patient. "It isn't designed to support the decision-making process of the physician," says Dr. Doug Will, chief of staff at the Loma Linda Medical Center in California.

"Our goal is to create a united patient record," says developer Rick Pionkowski.

The new regime

Medical developers are choosing the NeXT as their solution for three main reasons: connectivity, ease of use, and object-oriented design. Medical-information systems are – and will remain – too complex for hospitals to rely on only one platform to meet their needs, but the NeXT can pull all the various elements together into a coherent framework.

The new DBKit will make manipulating remote databases, like those in pharmacies and labs, much easier. Three of the five sites developing medical NeXT systems – Mt. Clemens, Oceania, and Logibec – plan to build their servers from hardware made by Sun Microsystems, accessing data stored in Sybase databases over Ethernet. It's a combination that makes perfect sense, says Pete Skinner of Oceania. By combining Sun with NeXT, he says, Oceania can take advantage of the best new technology available for both workstations and servers.

Not only can the NeXT talk to the database server, it can also communicate with all of the other networks already in place around the hospital, including Novell LANs, UNIX TCP/IP, and AppleTalk. Linking these systems might be the road to a paperless hospital. All information from medical procedures and doctor visits would be sent directly to the billing system, which would itemize direct and indirect costs. Prescriptions would be sent to the pharmacy system, and stat results from the lab would appear on the patient record as soon as they were finished.

None of this addresses Rosen's "fiddle-faddle factor," however – the toughest problem to overcome and the key to success in medical-information systems. Improvements have been introduced before but have failed to capture doctors' attention. NeXT developers believe they can build systems that are responsive to each doctor's preferences and individual style of practice yet integrate into the hospital's overall information structure. "The primary customer of a hospital is the doctor," says Chowdry.

Attempts to beat fiddle-faddle vary enormously, but all focus on creating options for data entry. The system at Mt. Clemens will be used administratively at first, so keyboard entry is crucial. There, the most critical items for ease of use are pop-up lists generally associated with codes, doctor names, or medications. Each list narrows as you type in letters, finally entering the final choice and returning to the entry view. The pop-up lists are based on code written for the hospital's mainframe application; on a NeXT, the pop-up feature becomes an object that can be used over and over again.

Oceania's approach might feel more familiar for the practicing doctor. A window opens for each patient with a series of tabs at the bottom, replicating the tabs from a standard medical file. Clicking on a tab switches the user to that portion of the record. Tecor's Advantage, on the other hand, starts with a Digital Librarian–like patient record that spins off billing, insurance, history, and other information from the Shelf, with each item creating a new window.

Beyond pure administrative tasks, NeXT technology is also playing a role in medical diagnostics such as radiology and MRI (magnetic-resonance imaging). The NeXT's Display PostScript capabilities make digital imaging not only feasible but desirable. Several programs under development include the ability to enhance a scanned X-ray with color, sketches, or personal notes, while keeping the original image intact. Hardware companies are developing scanners for large-format film, microfilm, and microfiche, as well as digital imaging to incorporate currently used systems.

Chowdry of Mt. Clemens points out that the cost of film still beats the equivalent of disk space by $5 or more. But tape archiving costs less than 4 cents per image and will last considerably longer than the current two years for film. Administrative savings are also great. Under the old system, doctors requesting an image from the hospital X-ray library had to wait anywhere from a few hours to a day or longer. Jukebox-type devices holding multiple years' worth of archived images could provide fast access, while current images could be stored on disk for immediate retrieval.

Eventually, high-resolution imaging will make surgical planning and training tools much more effective. These tools already allow doctors to plan their use of microscopic instruments inside the body before making an incision, decreasing both the time spent in the operating room and the margin for error. They also give interns a chance to hone their skills. The high resolution would make for much greater accuracy.

"The key to success is acceptance of the product by end users," says Pete Skinner of Oceania. "Common wisdom says that docs will never use computers. The challange is to create a compelling user interface."

The history of computers in medicine has shown that hospitals aren't as interested in upkeep of proprietary systems as they are in effective information technology. Chowdry's decision to go with NeXT is a simple one: "If we are doing a system that the hospital must use for the next 12 to 15 years, do we want to do it text-based or with a GUI?"

KRISTIN DYER *is an assistant editor at* NeXTWORLD *and a healthy cyberspace kid. She can be reached at kdyer@nextworld.com.*

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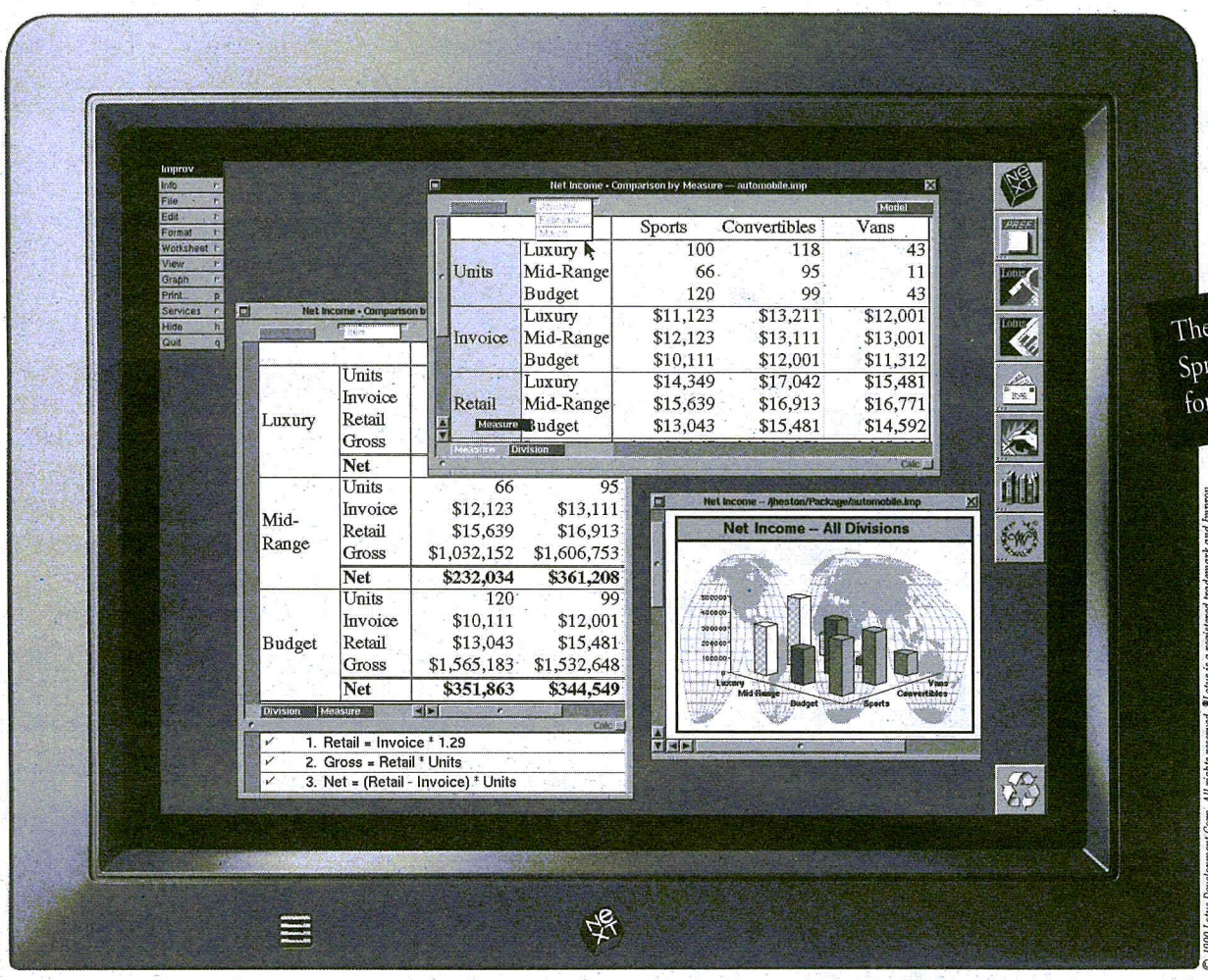

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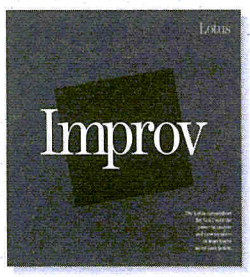

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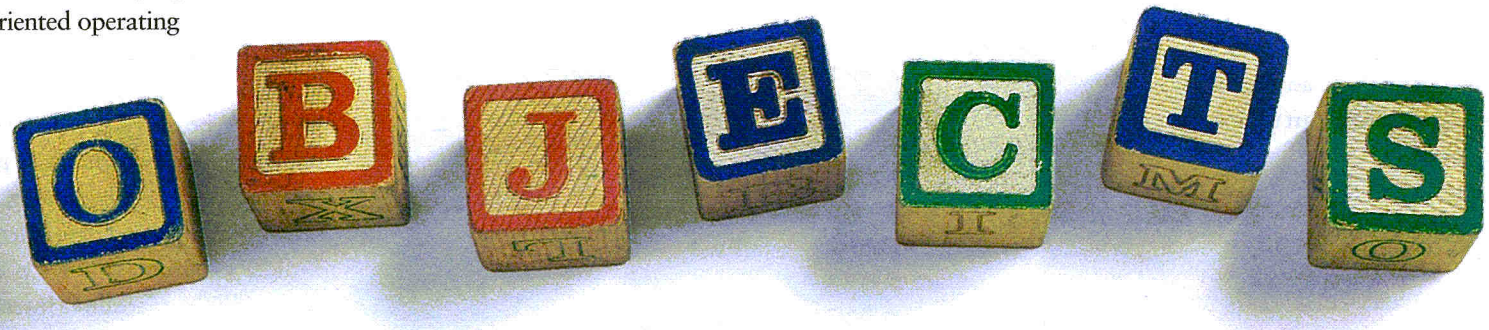
NeXT Has Two Messages: Real Objects Now. Interoperable Objects Soon.

BY SIMSON L. GARFINKEL

How do you get from here to there?

For most software developers, "here" is the familiar world of procedural programming languages, long development cycles, and a large base of hard-to-maintain legacy applications. "There" is the promised land of reusable objects and modular applications painlessly interoperating across networks and platforms. The gap remains large, filled more by white papers, proposals, and specifications than by usable object-oriented programming tools.

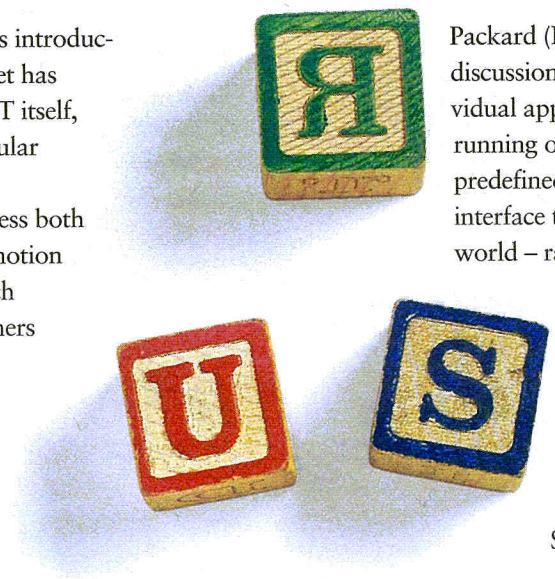
For NeXTSTEP programmers, who have enjoyed the benefits of an object-oriented operating system since NeXT's introduction in 1988, the gap is smaller. Still, their tool set has been largely limited to objects provided by NeXT itself, and interoperability with objects beyond the insular world of NeXTSTEP has remained illusory.



Now NeXT is pursuing strategies that address both the "here" and the "there." With its active promotion of a new category of commercial software, which NeXT calls ObjectWare, NeXTSTEP programmers will gain access to a much broader selection of prewritten objects, palettes, and software engines. Exhibit A in NeXT's "Real Objects Now" campaign is *ObjectWare: A Catalog of Objects and Kits for NeXTSTEP*, a registry of more than 100 third-party objects that developers can drop into their own custom applications and immediately put to work.

With its active participation in the Object Management Group (OMG), an industry consortium that defines standards for object interoperability, NeXT assures that NeXTSTEP software will conform to emerging industry standards. In fact, it says that NeXTSTEP objects already conform to OMG's specification for interfacing objects to networks.

By offering real objects now and interoperable objects soon, NeXT is seizing what CEO Steve Jobs describes as an historic opportunity: "There are moments in our industry when windows open up and new technology causes a fundamental realignment of the industry. We saw that with the personal computer, graphical user interfaces, and client/server computing. Object-oriented technology is one of these profound shifts."



Living with the past

Of course, NeXT is not alone in recognizing the advantages of object-oriented programming. By using small units of code that logically group together pieces of a computer program with the data that those pieces use, programmers are able to develop new applications in one-half to one-fifth the time they would require on conventional programming systems. They are also able to reuse objects in different programs, saving time and increasing program reliability, because the objects have already been debugged. (For more on the history and technology of objects, see "Object Lessons," *NeXTWORLD*, Spring 1992.)

But objects have an Achilles' heel: To get that speed-up in development time and increased reliability, programmers have to completely change the way they think about problems and develop applications. For companies trying to develop fully object-oriented systems, that means turning their backs on hundreds or thousands of person-years already invested in current products. For their customers, it can mean a conversion nightmare.

Perhaps that is why companies like Digital Equipment Corporation (DEC), Hewlett-Packard (HP), and Sun Microsystems shift the focus of the discussion about objects away from object-orientation in individual applications. Instead, these companies refer to objects running on a network and provide a particular service in some predefined way. True to the object-oriented model, it is the interface that these network objects present to the outside world – rather than their internal implementations – that really matters.

For example, SunSoft's Project DOE (Distributed Objects Everywhere) focuses on building a distributed environment. "Objects are a way of doing that, but the real problem we're trying to solve is the development, management, deployment, and use of distributed applications," says Steven Martino, director of product marketing.

For companies like Sun and HP, the promise of object technology has been frustrated by customers who are saddled with millions of dollars in conventional legacy applications – accounting systems, databases, and the like. Any move to an object-oriented future must include a way to bring older, traditional programs and data along.

To help solve these problems, Sun, HP, and six other companies got together in October 1989 and founded the OMG. Since then, the Framingham, Massachusetts-based consortium has grown to over 260 members, including industry leaders like Apple, IBM, Borland International, and Microsoft Corporation.

Unlike other industry coalitions founded around the same time, OMG was established to set standards, not develop programs. Their goal: Develop a set of specifications that would make it possible to build large-scale,

PHOTOGRAPH BY DAVID MAGNUSSON

networked-based applications. The real task of writing working programs is done inside the member companies.

The thrust of OMG's work has been to define object-like interfaces for legacy applications to communicate with new object-oriented applications, rather than starting afresh and developing fundamentally new software approaches from scratch.

OMG's biggest accomplishment to date is CORBA, the "Common Object Request Broker: Architecture and Specification." CORBA is a protocol for describing objects and sending messages over a network. It lays the blueprint for member companies to develop their own object-request-broker programs.

Several companies are now selling, or are about to sell, object request brokers based on CORBA. One such product is DEC's ACA Services.

Using ACA Services, a programmer can take an application program that was previously developed and "make it network accessible," says Mike Renzullo, the project's principal engineer. The advantage of the broker architecture is that another application wanting to use the network service doesn't need to know where the object resides. ACA Services might dynamically load the object into the calling program, start up another program on the user's workstation, or send a message over the network.

In addition to managing networks and starting remote applications, the object request broker also manages security, data flow, and other administrative aspects of client-server operations.

SunSoft's ToolTalk is similar to ACA Services, although ToolTalk doesn't currently follow the OMG standard.

Object request brokers are functionally similar to NeXTSTEP's Workspace Manager and Services facilities. With its announcement of OMG-conformance, NeXT seems to be saying that it has already completed an Objective-C implementation of CORBA. That would mean that all NeXTSTEP objects, from both NeXT and third parties, are now accessible to applications on other platforms.

Objects for sale

If interoperability is indeed a reality, NeXT's rivals can no longer claim that NeXTSTEP is proprietary and nonstandard. Nor can any competitor point to a library of objects as extensive as NeXT's. With its promotion of a new market for ObjectWare, NeXT is far ahead of the field in realizing a vision for the software industry of the future.

In the early 1980s, Brad Cox invented the term "Software IC" ("software integrated circuit") to describe an object that a software developer could buy from an outside company and simply plug into a program, much in the same way a person building a computer uses conventional integrated circuits. He then developed Objective-C, an object-oriented programming language specifically designed to make Software ICs possible (see the sidebar, "The O-O Language Wars").

There's nothing revolutionary about the idea of selling parts of computer programs. For years, people have been selling collections of functions, called subroutine libraries, which perform complex and highly specialized engineering or scientific calculations. Many DOS programs are now built upon commercially sold interface libraries.

But third-party libraries have always posed a problem for developers: Only rarely have they been compatible with one another. To make an analogy to the hardware world, it would be as if Intel and Motorola circuits couldn't integrate in the same computer.

Cox solved the software-compatibility problem by developing a standard mechanism for objects to communicate with each other. But there was a catch: To use Cox's solution, everything had to be written in Objective-C. And for years, Cox's company was the only firm selling Objective-C libraries.

That has changed as NeXT has gained market share and an increasing number of programmers have turned to Objective-C to write their programs. But what's made object selling a reality is NeXTSTEP's Interface Builder program, which lets third-party objects placed on Interface Builder palettes be "seamlessly integrated into the development environment," says Eric Bergerson, managing director of Objective Technologies, a New York–based NeXTSTEP software house.

"It's not just having someone write the code for you," contends Bergerson, whose company was one of the first to sell objects on the open market. Objective-C and Interface Builder let programmers "manipulate [the objects] within the environment that NeXT has provided. That kind of direct manipulation cuts down on a tremendous amount of development time."

OTI's palettes are primarily designed to help programmers build custom financial applications – not surprising, since OTI developed the palettes while consulting to major Wall Street trading houses. The company's MathPalette gives programmers an easy way to interface a custom application with Wolfram Research's Mathematica program. Application developers can perform complex mathematical calculations without having to learn higher math beforehand.

RDR, a Fairfax, Virginia-based NeXTSTEP developer, has developed a series of palettes with

Object Laggards

As a new computer system introduced in the late 1980s, NeXTSTEP was able to fully implement an object-oriented approach from the beginning. NeXT's competitors have had to phase in their object strategies.

"The world is not object-oriented now and we can't throw away the functions that we already have," says John Slitz, OMG's vice-president of marketing. Unless companies have a means for building a distributed, object-oriented environment out of parts that are both object-oriented and conventional, "it is flat out not going to work."

Microsoft, for example, builds Object Linking and Embedding, or OLE, into its Windows operating environment. OLE is a lot like NeXTSTEP 3.0's Object Links – it lets users copy and paste data between different application programs and have the pasted data automatically update when the source data later changes. But Microsoft's long-term strategy is a project code-named "Cairo," a totally new integrated windowing and workgroup environment that is still in the research-and-development phase.

"The goal is to [help the user] find information anywhere in the world," says Julie Plimpton, a company spokeswoman. Plimpton expects Microsoft to slowly fold the new Cairo technology – which she says is similar in principle to NeXTSTEP – into Windows. "The problem with current object-oriented products is that they make you give up your current investment. Our whole idea is that we don't want you to do that. We want you to maintain and keep your current investment in technology and be able to build on that."

Even Apple and IBM now seem to be backing off initial promises for their Taligent joint-development initiative. Although Taligent's object-oriented Pink operating system was originally billed by the two companies as a replacement for Macintosh System 7 and IBM's OS/2, both companies have recently reaffirmed their commitments to their own proprietary operating systems. The companies now claim to be targeting Taligent for customers who need an object-oriented platform to develop "mission-critical custom applications."

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Object solutions

Early this summer, NeXT put out the call that it was looking for objects. By the middle of June, over 100 submissions had poured into Scott Love's electronic mailbox in Redwood City – more than 50 of them arriving in the week just before the deadline.

"They were coming out of the woodwork," says Love, a NeXT developer advocate. "I'm overwhelmed by the number of submissions. It indicates that the object community is capable of becoming a thriving market-

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more general appeal. The company's RDRImage-View palette makes it easier for NeXTSTEP programmers to display an image in a NeXTSTEP window. RDRGadgets is a palette of lines, circles, boxes, and other tools for dressing up windows. RDRSwitchView is a tool for building inspector panels: The view can display up to 20 different subviews and let the user choose between them by selecting from a pop-up menu.

BenaTong, of Columbus, Ohio, sells an object that makes it easy to communicate with serial devices like modems and laboratory instruments. Brooklyn, New York–based Black Market Technologies sells a GridPalette that makes it easy to construct forms in a familiar spreadsheet format. Conextions, of North Andover, Massachusetts, sells a palette that lets developers place an IBM 3720 emulator into a program just by dragging and dropping it into a window.

There are a growing number of free or public-domain objects available for NeXTSTEP as well. Most of these objects reside on the NeXT Internet archive servers located at Purdue University and Oregon State University. These objects include a Display PostScript driver for the HP DeskJet II and palettes for drawing graphs, manipulating the NeXT's SCSI bus, and much more.

In fact, there are now so many objects available for NeXTSTEP that it is hard to keep track of them all. That's why NeXT decided to put them all together in a catalog.

Object solutions

Early this summer, NeXT put out the call that it was looking for objects. By the middle of June, over 100 submissions had poured into Scott Love's electronic mailbox in Redwood City – more than 50 of them arriving in the week just before the deadline.

"They were coming out of the woodwork," says Love, a NeXT developer advocate. "I'm overwhelmed by the number of submissions. It indicates that the object community is capable of becoming a thriving marketplace of products, ideas, and shared expertise."

For example, Anderson Financial Systems, a Philadelphia-based NeXTSTEP developer, "has a wonderful trader's workstation kit. Most of the classes that you need to build a custom trader's workstation solution are there," says Love.

Another unexpected find was a set of objects from Hot Software in Cambridge, Massachusetts, designed to help developers seamlessly integrate bar codes into their application programs.

Love emphasizes that NeXT isn't endorsing any of the objects in the catalog – it has merely gathered the information. People who wish to purchase an object still have to contact the developer and get the part; pricing and licensing terms will probably vary greatly. The catalog itself is available from NeXT for $10.95.

Indeed, in many ways the catalog is a marketing move. "The main audience is likely to be nontechnical managers and corporate users who probably still think of objects as Lego toys," says Love.

The ObjectWare catalog will do much to keep developers focused on NeXTSTEP's strength in the object-oriented arena – a completely integrated, object-oriented development environment – even while the company turns its attention to the politics regarding standards, strategic alliances, and networking issues of the OMG.

"There is all this talk right now about who has objects, who is the most object-oriented, who is real," says Liz Statmore, NeXT's object marketing manager. "We think that owning the definition of 'an object' is not what it is about. What we think the whole object market is about is customers using objects to develop applications and getting their jobs done."

SIMSON L. GARFINKEL *is a NeXTSTEP developer and senior editor at* NeXTWORLD.

The OO-Language Wars

One of the issues that's dogged NeXT for years is its choice of Objective-C as the object-oriented language upon which it based its computer.

Simula, the first object-oriented language, was developed in the 1960s as a language to build simulation systems. In the late 1970s, a team of programmers under Adele Goldberg at Xerox PARC (Palo Alto Research Center) developed the Smalltalk language and environment.

Since then, the world of object-oriented languages and environments has fragmented. Nearly every major computer language now has an object-oriented cousin. There's even a fledgling object-oriented COBOL for business applications.

But when it comes to C, the computer language popularized by the UNIX and DOS operating systems, there are two object-oriented choices: Objective-C and C++.

Objective-C is the object-oriented language developed in the early 1980s by Brad Cox. In many ways it is a blend of C and Smalltalk, retaining much of the power of each to solve problems by sending messages between objects. C++ was developed at AT&T by Bjarne Stroustrup at approximately the same time. The language has many more features than Objective-C and is far more complicated. Nevertheless, C++ lacks the key feature that sets Smalltalk and Objective-C apart: dynamic binding.

Objects communicate in an object-oriented environment by sending messages to one another. In a system that uses dynamic binding, those messages are interpreted when the program is run rather than when it is compiled. If a program contains code that shuts down peripherals, for example, the method call doesn't have to specify all the different possible target devices. When the code is compiled, the compiler checks only that the method call is properly formatted to communicate with a perpipheral. At run time, the different peripherals' objects will be dynamically bound, and the programmer can check that the program actually shuts down a printer or a drive or an imagesetter. As a result, systems that use dynamic binding are more flexible and easier to update than their static cousins.

Dynamic binding is also what makes Software ICs possible. Without it, a programmer using an object library needs to be far more concerned with how the objects actually implement their functions. It is the reason that NeXT chose to use Objective-C. Without dynamic binding, Interface Builder would have to be precompiled, with all the classes of objects that the user can manipulate. It would be impossible to load in new object types.

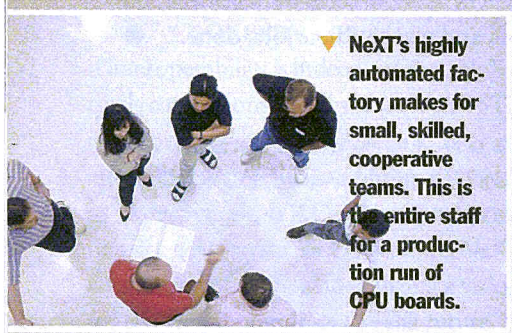
Despite Objective-C's technical advantages, few computer makers other than NeXT have opted for it. "The fact of the matter is that today there are more C and C++ programmers out there than any other [object-oriented language]," says Michael Mathews, product marketing manager for HP's distributed-object computing program. "To develop an environment that narrowed your target audience [from the onset] wouldn't be a smart thing to do."

PHOTO TOUR

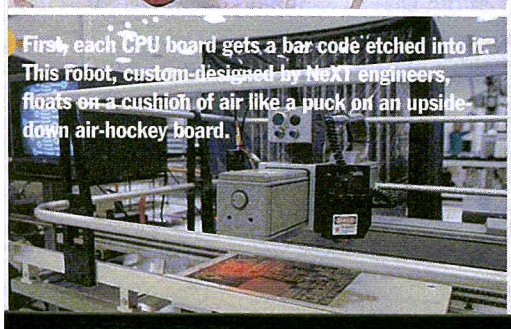
At the Factory

Last year, we took you inside NeXT's secret product labs for a glimpse of NeXT technology in the making. Here's a look at products in the making at NeXT's factory, which has been described as the finest automated computer-manufacturing site in the world. Our photographer had unprecedented access to the Fremont, California, facility.

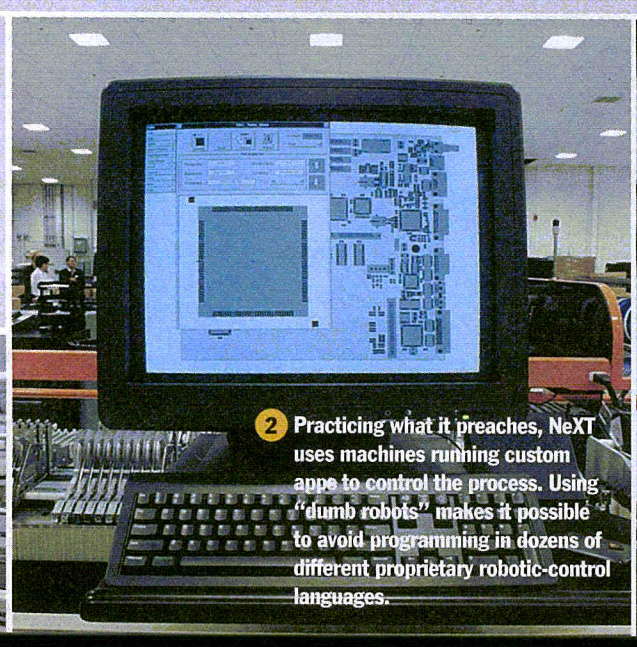
Careful planning and cutting-edge CIM (computers in manufacturing) techniques make for sensational results. With only three people on the production line, six doing inspection and testing, and five in product assembly, NeXT is able to build machines to order and still enjoy one of the lowest return rates in the industry.



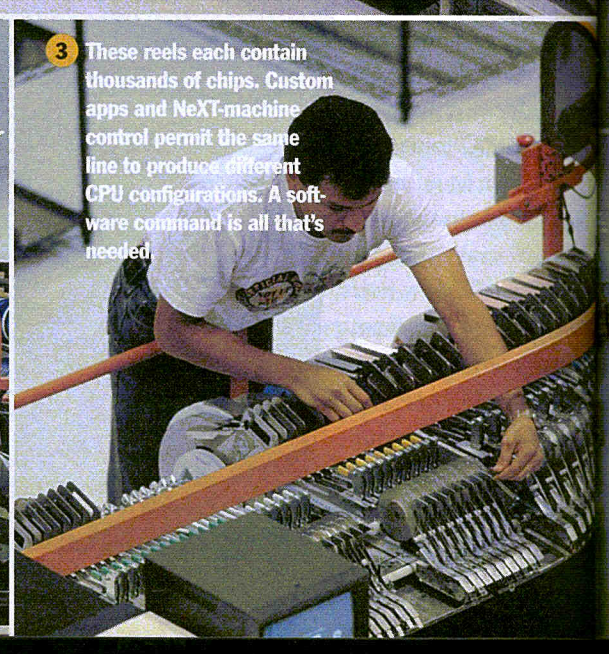
▼ NeXT's highly automated factory makes for small, skilled, cooperative teams. This is the entire staff for a production run of CPU boards.



First, each CPU board gets a bar code etched into it. This robot, custom-designed by NeXT engineers, floats on a cushion of air like a puck on an upside-down air-hockey board.



2 Practicing what it preaches, NeXT uses machines running custom apps to control the process. Using "dumb robots" makes it possible to avoid programming in dozens of different proprietary robotic-control languages.



3 These reels each contain thousands of chips. Custom apps and NeXT-machine control permit the same line to produce different CPU configurations. A software command is all that's needed.

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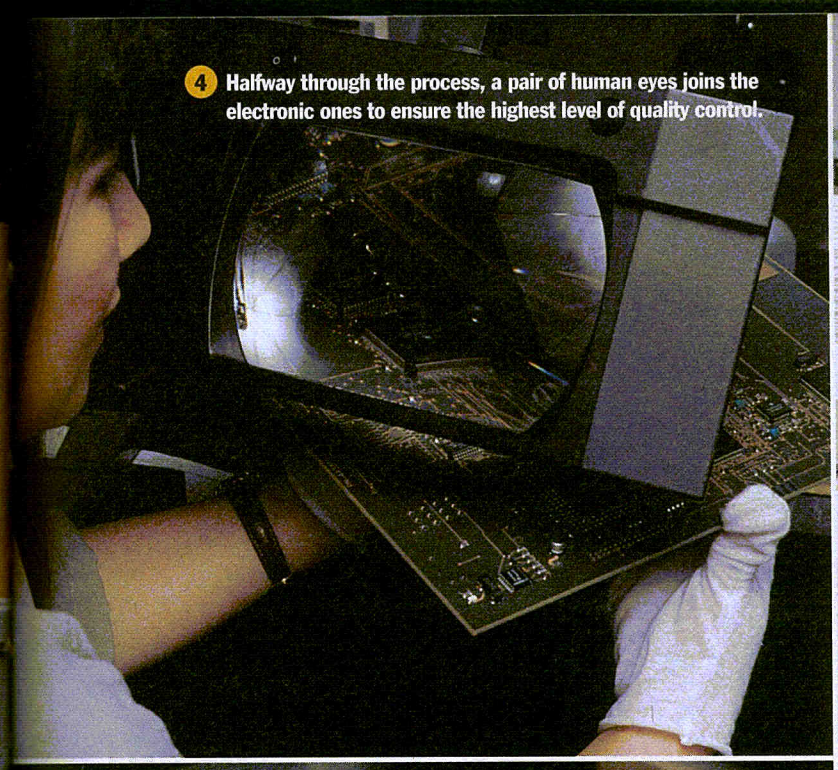
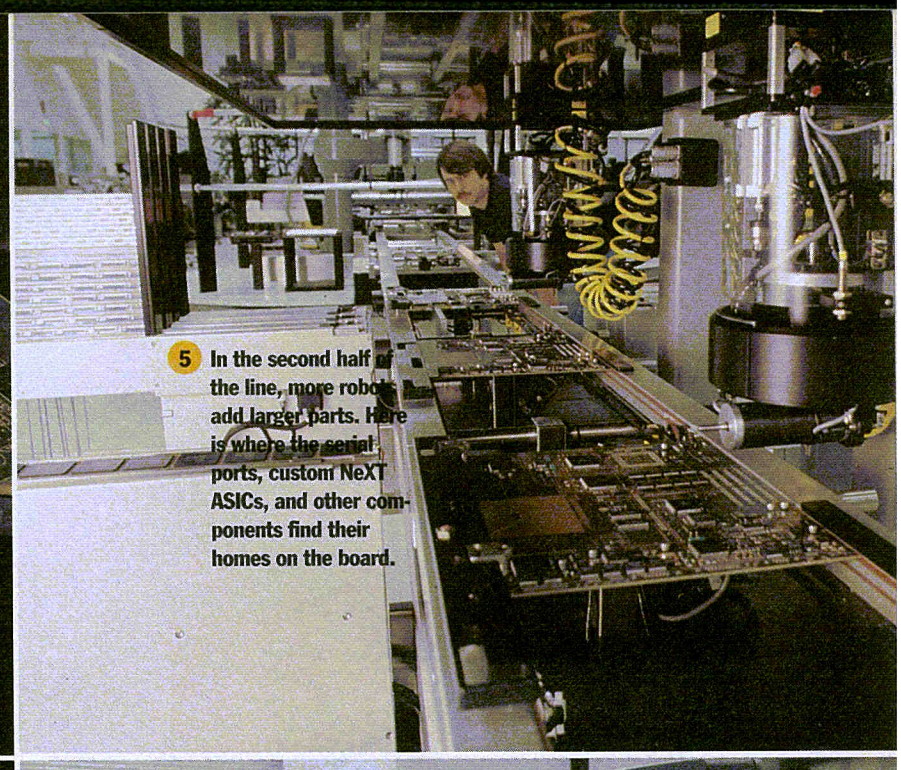
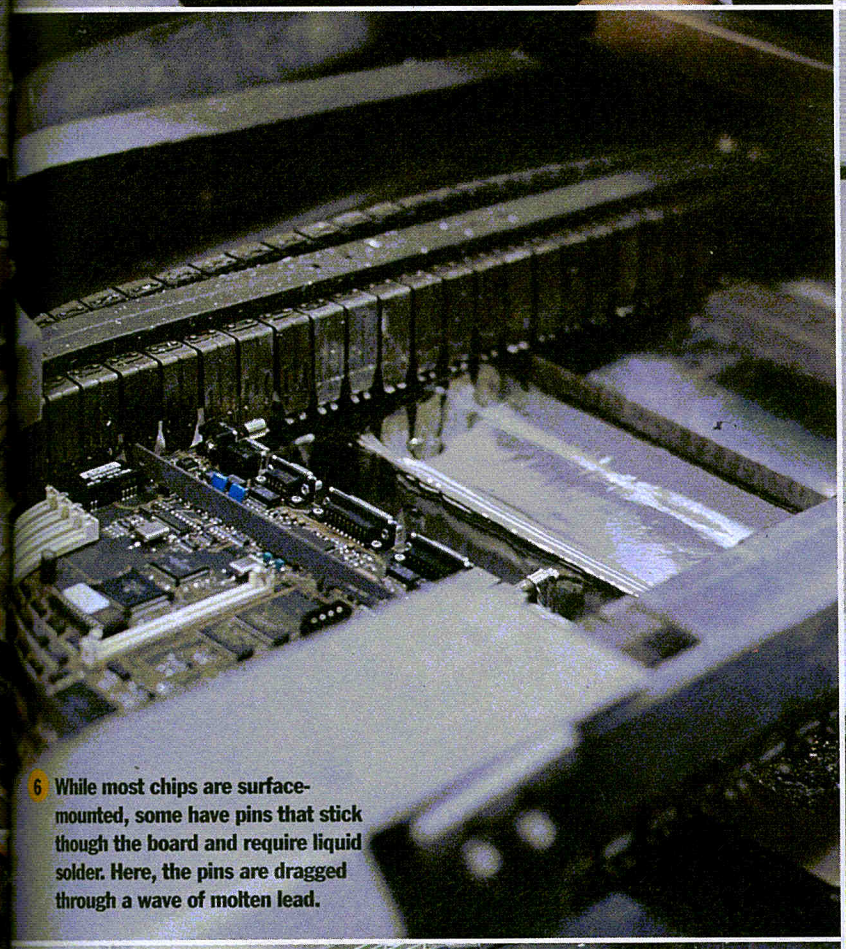


4 Halfway through the process, a pair of human eyes joins the electronic ones to ensure the highest level of quality control.



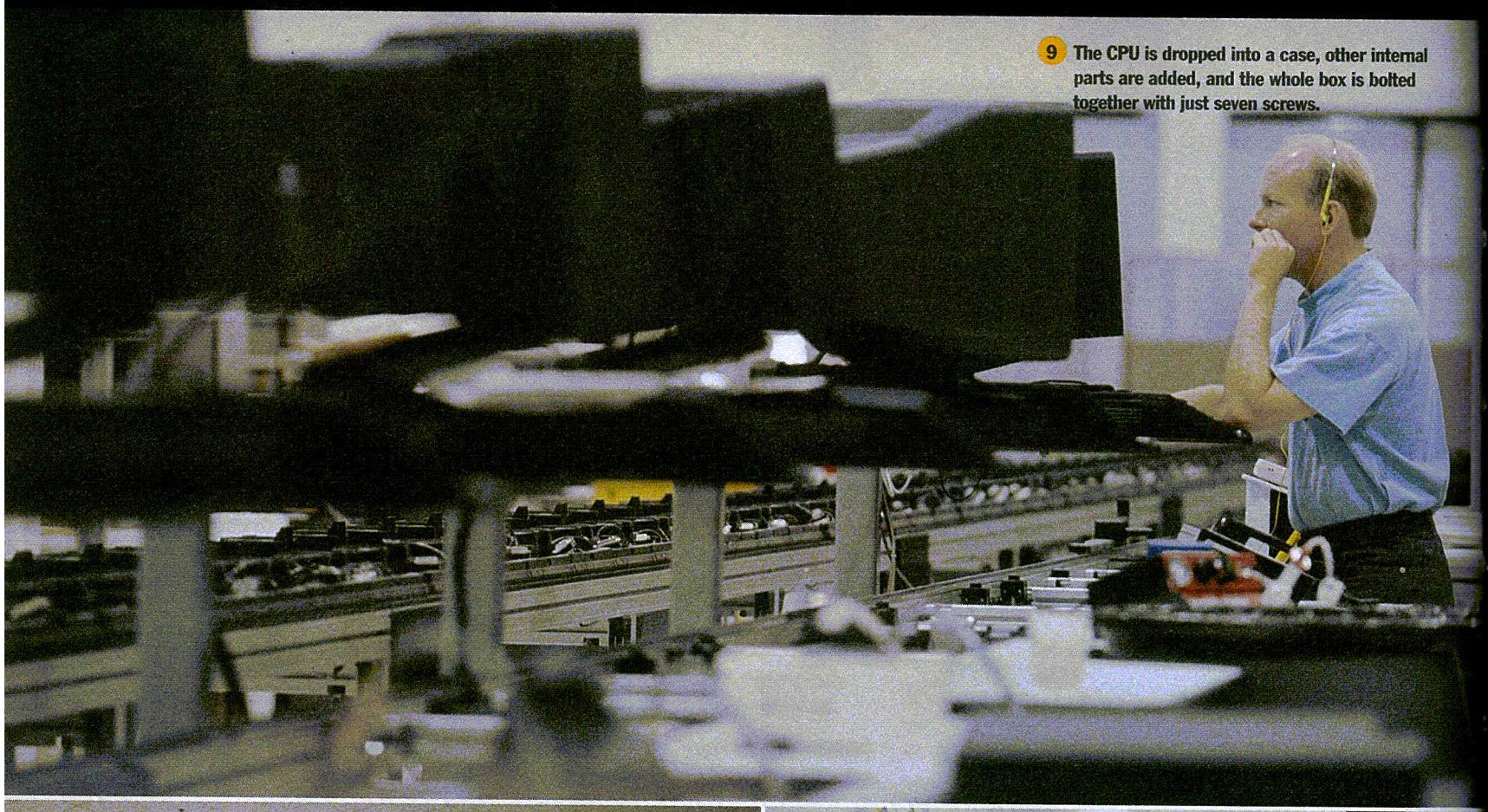
5 In the second half of the line, more robots add larger parts. Here is where the serial ports, custom NeXT ASICs, and other components find their homes on the board.



6 While most chips are surface-mounted, some have pins that stick though the board and require liquid solder. Here, the pins are dragged through a wave of molten lead.

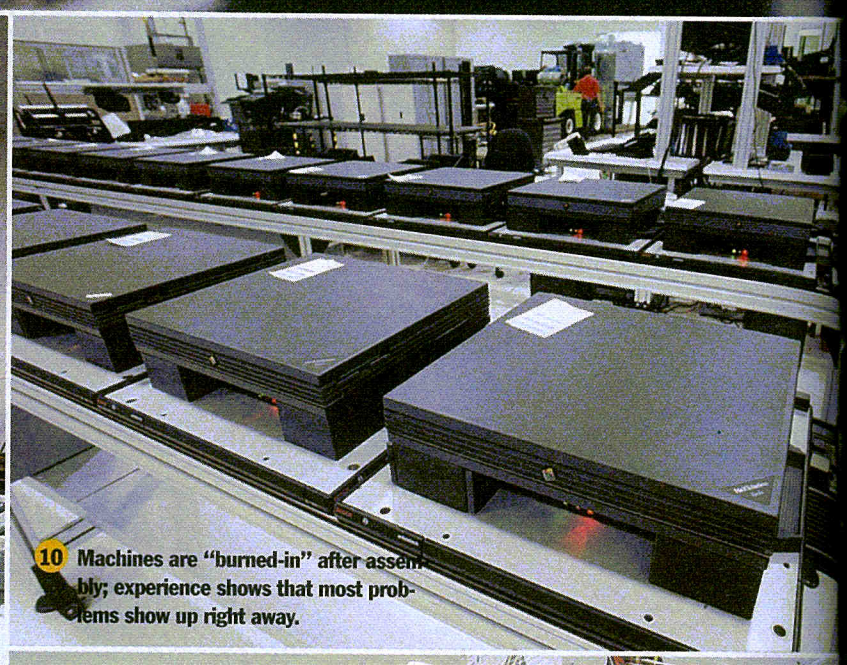
8 A full complement of peripherals is plugged in to each CPU board before it is put through a rigorous workout under accelerated real-world conditions.

7 The NeXTdimension board gets a special, full-color workout of its 32-bit capabilities before heading out the door. Speaking of color, the lights in the factory are specially designed to reproduce sunlight.



9 The CPU is dropped into a case, other internal parts are added, and the whole box is bolted together with just seven screws.

11 Each NeXT machine represents the work of some 500 people worldwide. This group is responsible for the very last touches: final assembly and packing.



10 Machines are "burned-in" after assembly; experience shows that most problems show up right away.

12 With sales up since last year, boxes are flying out the factory door.

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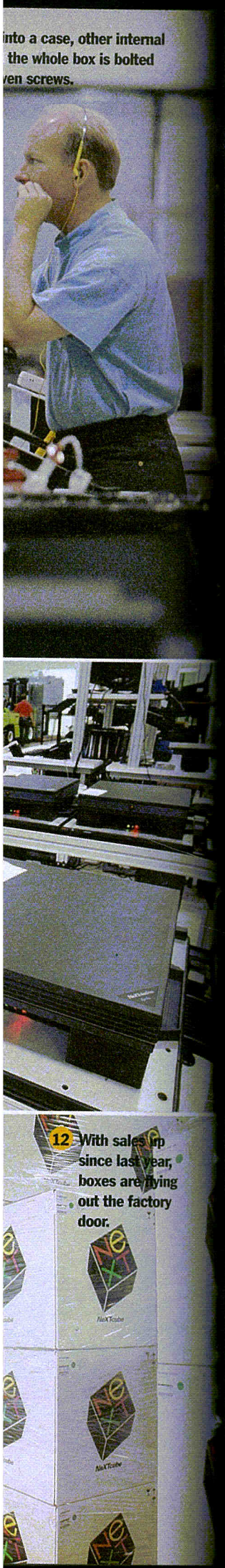

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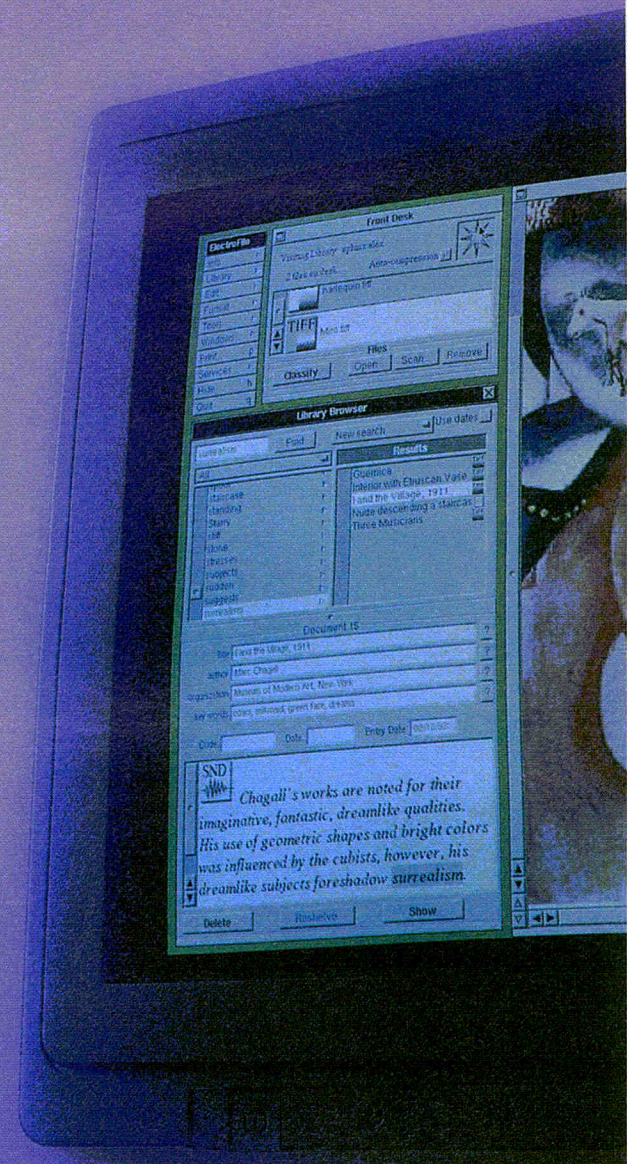

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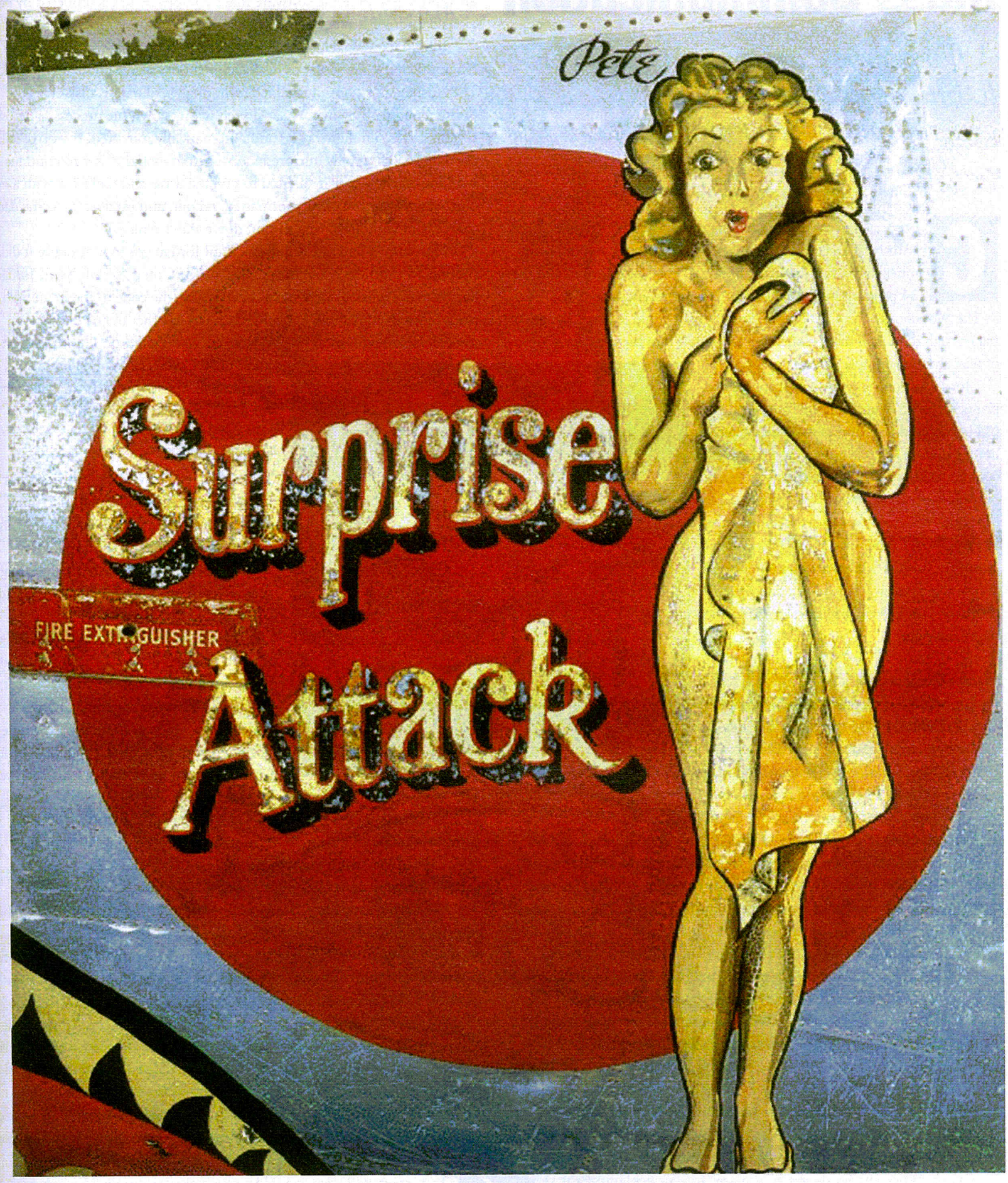

Mass Communication

A fiber-optic carrier uses NeXTSTEP to build software for the next generation of telecommunications

by ELIOT BERGSON

Corporate developers are finding out that building applications with NeXTSTEP leads to unexpected changes and opportunities in the very basics of business. For Vince Jordan and the 34 programmers at Williams Telecommunications (WilTel) in The Woodlands, Texas, software development could lead to changes big enough to launch them – and the rest of us – into the next generation of telecommunications.

Jordan's group is developing software and protocols for an Asynchronous Transfer Mode (ATM) network, a brand-new switching technology that will enable users to send data and communicate in real time at presently unheard-of speeds over an 11,000-mile fiber-optic cable network. When the system is installed on a bank of NeXT machines at WilTel's control center in Tulsa, Oklahoma, customers will also be able to receive "knowledge engineered" alarms and on-line video help. It looks like the future, all right.

WilTel's Vince Jordan selected NeXTSTEP to develop innovative software for a high-speed data network.

Unconventional outlook

Jordan originally thought the project would rely on IBM RS/6000s. "I was reading one of IBM's promo brochures," the 35-year-old director of information systems says, "and it talked about NeXTSTEP. I said, 'I want to see this!' " So he rode his motorcycle up to a demo in Austin, but instead of seeing NeXTSTEP on RS/6000s, he played on a NeXT for two days – and sped back to Houston. "I told my rep I had to have NeXTSTEP, but of course he couldn't deliver," Jordan recalls. In the end, he bought 100 NeXT machines – and one RS/6000 as a "way of saying thanks."

With his shoulder-length hair and scruffy beard, Jordan looks more like a hacker than an IS director, but being unconventional is just his particular way of getting things done. "The only hardware I really care about is my bike," he says with a smile. "With computers, I care about what's inside." He took the same view when hiring developers: He interviewed over 100 before settling on 34 of the best Smalltalk and Objective-C hackers in the business, from as far away as India, China, and Poland. "I'm running the U.N. of software development," he says.

Jordan's team developed the ATM network management simulator and then gave the code to the switch manufacturer for testing the equipment. When the hardware is in place, Jordan explains, he'll also be able to test the prototype against the same parameters used in manufacturing. "This is what NeXTSTEP is all about," he says. "It allows an approach to building software that's completely unencumbered by previous corporate strategies."

Jordan likewise felt unencumbered about choosing the new Auspex NS 5500 UNIX file server as his local-area NFS server and backup device. The Auspex uses "hot-pluggable" technology: All data is disk-striped (written and read by many heads, each with its own file processor, across several drives simultaneously) and automatically mirrored. If a drive fails, the data switches to its mirrored location, allowing the user to continue working. Technicians are alerted to pull the drive and replace it with a new one, which is automatically formatted, rebuilt, and used again as the data source – all without having to shut down the machine.

The Auspex had one drawback until Jordan got to it, though: It didn't support NetInfo. So while Auspex began work on a NetInfo port, Jordan hacked out a workaround and – again – gave the code to the manufacturer. Since then, Auspex has sold machines to other major NeXT customers, including Bozell, Jacobs, Kenyon, and Eckhardt; Phibro Energy; and SBC/OC Services. WilTel has also bought another NS 5500 as the backbone for its ATM network control center.

Moving gigabits

Just as WilTel's development process has helped streamline switch manufacturing and create a viable NeXT market for Auspex, so will it change the future of the telecommunications industry by allowing customers to push far more data over dedicated lines.

Private-line carriers currently sell the right to transmit across dedicated telephone wires or fiber-optic cables; AT&T, Sprint, and MCI all have private line divisions, which charge each customer for an entire line, no matter how often or how much it's used. The breakup of Ma Bell also allowed smaller firms – like WilTel – to build and support transmission networks. WilTel's customers now push through 45Mbits per second on a DS3 channel (a basic unit of fiber-optic capacity), a figure that will increase to 1.2Gbits per second on an improved OC3 channel in 1993.

ATM switches will offer a quantum leap in throughput, handling the equivalent of 48 OC3 channels – over 50Gbits of data per second. And each of the 48 switch fabrics can be configured for 4097 circuits, allowing that many customers to share the switch at the same time. "Today I can give you a DS3 to communicate between San Francisco and New York," Jordan says. "It's yours, whether you fill it or not. With the ATM switching technology, I can take that DS3, and because of the virtual switch technology, share that DS3 among many users."

This will radically change the business of private-line carriers. Customers have traditionally paid for access to an entire channel; they owned the bandwidth. With ATM, Jordan explains, customers will pay for the right to transfer across a switch when they need to. Private-line carriers will need to build a much greater installed base, but ATM's speed could easily establish it as a new standard.

PHOTOGRAPH BY JACK ZEMAN

Feature creep

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PHOTOGRAPH BY JACK ZEMAN

Feature creep

Jordan's team has had to walk a fine line between offering innovative software and overloading the end user. Because NeXTSTEP is such a simple development tool, programmers have to stop themselves from putting too much functionality in the software. "I keep listening to customers, then go to my people and ask if we can do this or that," says Jordan. "They don't say 'no' often – but we have to watch out for 'feature creep' – too much functionality. We want to break down barriers here, not construct more."

WilTel's customer software has modules for installation, record-keeping, security, preferences definable by department, billing, and trouble reporting. It can also talk to other platforms' network managers, like IBM NetView and SunNet Manager. Jordan is targeting customer-specific configuration as a way to build innovation instead of confusion. For example, developers are working in a demo room equipped with a full editing studio to produce a video-based help system that customers will be able to access in real time. "We want to give hypermedia help," Jordan says. "NeXTSTEP 3.0 gives that functionality, but this will go a step further. A user could watch a technician schedule a circuit, if that's what they need. They can back up the tape, fast forward it. It's all up to them." The videodisc library may be completed as early as next year, if compression technology becomes available.

In addition, Jordan's team has constructed an alarm-monitoring system with "rules-based reasoning capabilities." A breakdown in any computer system can send hundreds of messages scrolling past a system administrator. If there is a problem on a customer's ATM network, the software's customizable configuration will intelligently formulate error messages and give administrators just the information they need to report the problem. The software also includes a "trouble ticket" to automatically initiate problem reports and track their progress through WilTel's control center.

By keeping his eye on innovation and his ear open to feedback, Jordan hopes to promote what he calls "knowledge engineering" with his clients. "I hate the term 'artificial intelligence,' " he says, smiling again. "You bump into artificial intelligence all the time on the street."

ELIOT BERGSON *is associate editor at NeXTWORLD.*

UPDATE

Union Bank of Switzerland Securities goes global

Having started out with 14 NeXTs a year ago in the equity derivatives trading department (see "Bull Market," *NeXTWORLD*, Fall 1991), Union Bank of Switzerland (UBS) Securities has expanded its custom software and enlarged its operation to 70 machines networked between New York, London, Zurich, and Tokyo. All new hardware purchases have been NeXTstation Turbo Color slabs.

UBS's equity-derivatives software tracks fluctuations in key marketplaces so that traders can reduce the risk to an investor's portfolio. Five developers at UBS have now built software modules that perform risk analysis, option trading, and exotic-option modeling. "This enables us to perform over-the-counter option trades for customers at the best possible price and leaves enough room for our margin," says Hadar Pedhazur, vice-president of equity technology.

UBS is also using Fame, a time-series database analytical tool developed by Citibank, to help with historical data analysis.

UPDATE

Alain Pinel builds modules and bridges

With her Saratoga, California, office securely networked (see "Alain Pinel: Second office networked," *NeXTWORLD*, Spring 1992), Helen Pastorino has turned toward enhancing Alain Pinel Realtors's custom software. She is developing a close working relationship with escrow agents in the area and has started putting together a real-estate accounting package.

A new module has been added to Areas, the software developed in conjunction with Adamation, of Oakland, California, to help agents at Alain Pinel track escrow closings. A second update to the software incorporates buyer net sheets, on which a home buyer's fee schedules, appraisals, and projected tax payments are figured.

"Agents can be on-line at all times and know where the escrow process is," says Pastorino. "Communications between the client and agent is much better."

Pastorino solicited feedback from escrow and title companies in an attempt to "standardize the escrow industry and get them to work with us," she says. Fidelity National Title of Los Gatos, California, has purchased three NeXTstations and a laser printer. Alain Pinel personnel are training Fidelity users in the basics of NeXTSTEP and Pinel's custom software.

The Areas software has also been expanded to automatically store data and modify an in-house database based on information received during the escrow closing. The information also updates an internal accounting package under development.

UPDATE

L.A. County Sheriff tightens its belt

As tighter budgets have become a fact of life in California, the Los Angeles County Sheriff's Department has had to forge a leaner computing environment and delay full implementation of its "executive support system" (see "Digital Deputy," *NeXTWORLD*, Spring 1992).

"This is really an opportunity as opposed to a catastrophe," says Claude Farris, captain of the data systems bureau. "We can leverage the substantial knowledge of the internal staff and let them accomplish the implementation over time. This allows them to gain experience from physically doing the task instead of coordinating or monitoring outside consultants."

Charged with producing savings without layoffs or reductions in rank, Farris combined staff to create project teams that will implement an "information network and technology infrastructure," he says. This will allow the department to "put the technology on desktops, tie it together over a network, and incrementally move in the direction we'd been moving."

The bureau has begun using DataPhile, Stone Design's flat-file database software. It has also finished analysis on a "patrol-station automation project" utilizing Oracle's relational-database management system.

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Get the most from NeXTSTEP 3

PHOTOGRAPH BY DAVID MAGNUSSON

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Just the Fax

Who needs paper? A trio of modems let you fax directly from your NeXT

by SIMSON L. GARFINKEL

Faxing has become an essential technology for almost everyone in business today. The traditional way of faxing involves printing out a copy of a document, then using a fax machine to rescan the document into binary format and sending it out over a phone line.

A better approach is to hook the computer directly to the phone line with a fax modem, avoiding the use of paper altogether. This also produces crisper faxes at the receiving end. On the inbound side, a fax modem makes incoming faxes available immediately on your computer; you can type on them with a drawing program or use an optical-character-recognition (OCR) application to translate the image into computer-readable text. Add a scanner to your NeXT and you can also fax documents derived from sources other than computers.

With NeXTSTEP 2.0, NeXT introduced nearly seamless outbound fax capability – just print to the fax instead of to a printer or file. But the inbound process was less efficient. Although the fax modem was designed to sit on the network, incoming faxes were e-mailed to a single user who then had to manually forward them to their proper destination. If that user wasn't reading his or her mail, faxes didn't get delivered.

NeXTSTEP 3.0 solves many of the problems with in-bound fax reception. Instead of being e-mailed to a particular user, incoming faxes are stored in a spool directory from where they are assigned to a user by the fax administrator. The new PrintManager application lets you designate as many fax administrators as needed. You can also have NeXTSTEP automatically print each fax when it arrives.

All fax modems are designed to also operate as a standard telecommunications modem. Unfortunately, NeXTSTEP's built-in fax driver takes over the modem, allowing you to use the fax modem only for faxes. If you want to use the fax modem for standard telecom, you need to run the PrintManager program and manually disable your computer's faxing capability or use a piece of utility software.

NeXTSTEP 3.0 doesn't solve the fax lockout problem – NeXT's driver still doesn't automatically switch between data and fax. NeXT has decided to let third-party developers market solutions instead.

Lockout problems or not, electronic faxing capability is still extremely valuable, and a number of manufacturers have brought fax modems to the NeXT market. We'll look at three that are shipping, revise our opinion of another that we previously reviewed, and consider a piece of fax-modem utility software.

Get the most from NeXTSTEP 3.0: clockwise from left, SupraFAXModem, HSD FaxMaster 96/24X, ZyXEL U-1496, DoveFax Desktop.

PHOTOGRAPH BY DAVID MAGNUSSON

DoveFax Desktop

The DoveFax Desktop is a transplant of the company's fax modem for the Macintosh. It is a barebones 24/96 fax modem, meaning that it is equipped to transmit and receive data like a 2400-baud modem and transmit and receive faxes at 9600 baud.

The Dove was the smallest modem we reviewed. It is also the only modem we have ever seen that lacks a power switch – instead it sports a long cord with a molded connector in the rear. We didn't like this configuration: If you happen to accidentally damage the cable, you have to send the entire modem back to Dove.

The DoveFax comes with its own driver, which must be installed with NeXT's Installer program, although the driver does not appear to be functionally different from the standard NeXTSTEP driver. It had no trouble working with both NeXTSTEP 2.1 and 3.0.

On several faxes that we transmitted, the DoveFax had the annoying habit of momentarily turning on its speaker at the beginning of every page. Nevertheless, the faxes looked clean and crisp on the other end – identical, in fact, to material sent from other fax modems. The modem had no problem receiving faxes from a variety of other fax modems and machines.

HSD FaxMaster 96/24X

HSD's FaxMaster is a solid fax modem. Its 2400-baud modem includes MNP5, which means that you'll see a slightly faster error-free connection when connecting to other MNP5 modems. The HSD FaxMaster 96/24X was formerly sold for NeXT computers under the Abaton label.

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HSD provides serial cables for both '030 and '040 NeXTcubes and NeXTstations. Only a two-conductor telephone cable is provided, though; you must replace it to use the FaxMaster with a multi-line telephone. The documentation is excellent, including instructions for both installing the modem and viewing faxes.

The FaxMaster uses NeXTSTEP's built-in driver; under NeXTSTEP 2.1, this is the Class II driver. Since the Class II specification is still not finished, and since many modems claiming to be Class II have substantially different command sets, NeXT changed the name of the driver to "HSD Fax Modem" with NeXTSTEP 3.0.

Over six months of use, the FaxMaster has sent faxes flawlessly. While we have twice had problems receiving faxes from oddball fax machines in the field, these were the only glitches from a much larger sample size than either the Dove or the ZyXEL were subjected to.

ZyXEL U-1496

ZyXEL U-1496 is the king of fax modems. Its data side features a 14,400-baud modem with an impressive array of protocols, including V.22bis, V.32, V.32bis, and V.42. The fax component sends and receives at 9600 baud.

The ZyXEL has a two-line, 20-character LCD status display panel with four buttons for navigation and changing setup parameters. The LCD screen makes it easy to follow the status of your connection and helps in debugging communications problems. Once the connection is established, the screen prints the average throughput in each direction.

The ZyXEL also contains support for Distinctive Ring, a new feature from the phone company that gives you up to four different telephone numbers but only one physical line – each telephone number gets its own ring. With appropriate software, you can instruct the modem to only answer one particular kind of ring. The modem also supports Caller-ID, which – again with appropriate software – would make it easier to track down people trying to break into your computer.

Although the ZyXEL operated flawlessly as a fax modem, we had to specifically tell it to turn off MNP5 when communicating with a particular 2400-baud modem that did not support the error-correcting protocol.

Other suppliers

We previously reviewed the Neuron FAX96+ modem (*NeXTWORLD*, Winter 1991). At the time we gave it high marks for a low price point, solid operation, and promises of excellent bundled software. The software never fully materialized, however, and Neuron has stopped marketing the product. They have even stopped answering their phone. In the light of many customer protests and Neuron's inactivity, *NeXTWORLD* is suspending Neuron's cube rating at this time.

In the light of many customer protests and Neuron's inactivity, NeXTWORLD is suspending Neuron's cube rating at this time.

Two other suppliers, Supra and Prometheus, have announced plans to bring their fax modems to the NeXT market. Unfortunately, neither company was able to provide us with a sample product before our deadlines.

A better driver

NXFax is a NeXTSTEP fax driver that solves the fax-lockout problem. Using this driver and an advanced fax modem such as the ZyXEL, you can use the same modem for data or fax: The driver automatically senses what you wish to do and activates the appropriate modem function.

We tested NXFax with the ZyXEL U-1496. The combination worked flawlessly: Incoming faxes were properly delivered to the fax spool directory, and NeXTSTEP alerted the fax administrator that the faxes had arrived. Outgoing faxes were delivered immediately. UNIX communications programs like **tip**, **cu**, and **kermit** worked whenever faxes were not being received or transmitted. Future versions of this driver should support Distinctive Ring and Caller-ID.

B&W Software is bundling its NXFax driver with the ZyXEL modem and a cable for $600. The driver will also be offered seperately for people who already purchased a Neuron modem.

Total System Software is developing a NeXTSTEP fax driver similar to B&W's, but the software wasn't ready in time for review.

SIMSON L. GARFINKEL *is a senior editor at* NeXTWORLD. *He can be reached at simsong@nextworld.com.*

DoveFax Desktop	*A small, low-cost 24/96 fax modem that opens up the world of fax to NeXT users. Molded cable and lack of power switches are minor nusiances.*	**$279**	*Dove Computer Corporation, 1200 N. 23rd St., Wilmington, NC 28405. 919/763-7918.*
HSD FaxMaster 96/24X	*A solid 96/24 fax modem. This modem features MNP5, although you probably won't use it if you dedicate the modem to fax use.*	**$495 (bundled with OCR Servant)**	*HSD Microcomputer US, 1350 Pear Ave., Ste. C, Mountain View, CA 94043. 415/964-1400, 800/828-5522, 415/964-1538 fax.*
ZyXEL U-1496	*The Cadillac of modems, it speaks virtually every protocol in the book and includes support for features such as Caller-ID and Distinctive Ring. Handy alphanumeric display.*	**$467**	*ZyXEL USA, 4920 E. La Palma, Anaheim, CA 92807. 714/693-0808, 800/255-4101, 714/693-0705 fax.*
NXFax	*A utility that allows fax modems to be easily used for both fax and telecommunications. Worked flawlessly in our tests.*	**$135 ($600 with the ZyXEL U-1496 and cable)**	*B&W Software, 442 South Hill Rd., Moretown, VT 05660. 802/496-5113.*

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Circle 64 on reader service card

Its Own Reward

COMING ATTRACTIONS

Virtuoso aims high by combining illustration and page-layout tools

by TONY BOVE *and* CHERYL RHODES

When we heard last year that Texas-based Altsys was readying a NeXT version of FreeHand, the venerable Mac and Windows drawing program it created for Aldus, we assumed that the market battle between FreeHand and Adobe Illustrator was simply moving to a new venue. Now that the product has arrived in the form of Altsys Virtuoso, it turns out that the company had a bigger objective in mind: to be number one in PostScript-based design and production.

Priced at $695, Virtuoso offers sophisticated tools for illustration and freehand drawing, plus typographical and organizational features for creating single-page layouts. According to Altsys, Virtuoso is the first program on the NeXT platform to provide illustration, layout, and the capability to color-separate TIFF images.

Altsys certainly knows how to work with PostScript, having developed not just the award-winning FreeHand but also Fontographer, the first program to enable professional PostScript typeface design and editing. The company has incorporated the features of NeXTSTEP 3.0, including pressure-sensitive-tablet support for the program's calligraphic and variable-weight pens, Object Links to dynamically share data with other applications, as well as Pantone Matching System and PostScript Level 2 support.

We reviewed an early beta version of the program and were very impressed, especially with its drawing features and text-formatting capabilities.

Coolest features

We were immediately intrigued by the Layers feature, which organizes illustrations into named layers that can be separately printed, viewed, and locked (Figure 1). Layers make it easy to change the stacking order of overlapping elements in a drawing or to print documents without printing their TIFF images (by isolating the images to a nonprinting layer). You can also manipulate the stacking of elements in a single layer with Bring to Front, Send to Back, and so on.

Other cool features include easy alignment and distribution. Virtuoso can align selected objects based on the rectangular area each object occupies. It can also distribute, or space out, objects evenly along an axis, even if they are different in shape and size.

For shading contours and tapering colors, you can create a blend, a series of intermediate paths based on the shapes of two original paths. Virtuoso, like Adobe Illustrator, lets you blend between any two ungrouped paths (either two open paths or two closed paths, but not an open path and a closed path). The paths can have different colors and fill patterns. We particularly liked the ability to automatically reblend without having to delete and regenerate the steps.

The Paste Inside feature lets you use a path as a clipping region, which exposes an image underneath the path. You can use it to crop an image, create a window inside an image, or create the illusion of transparency. Virtuoso pastes the object you previously placed inside the selected path. Once inside the path, the object can be moved as you move the path, or you can move the path without moving the object.

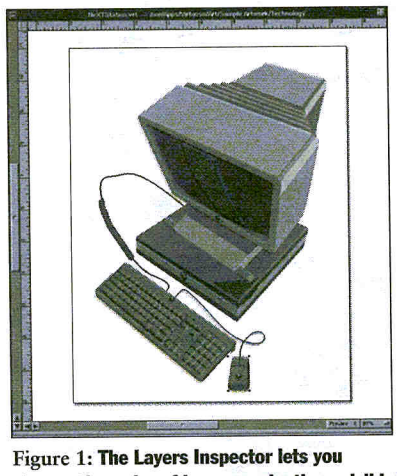
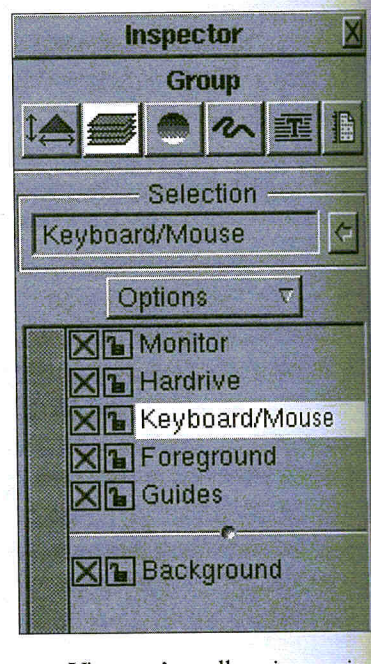


Figure 1: **The Layers Inspector lets you change the order of layers, make them visible or invisible, lock or unlock them, place them in the foreground or background, and make them printing or nonprinting.**

The program separates all color images, including RGB TIFF images, and you can preview the separations on screen. Virtuoso also offers trapping control in the separation process, and the RGB-to-CMYK conversion feature allows you to predict the process ink colors before printing.

PostScript programmers will be impressed by Virtuoso's ability to specify pure PostScript code in order to create special effects such as custom lines and fills. You can type up to 255 characters of code in the Inspector panel. For larger sections of code, you can write your own UserPrep file.

"Coming Attractions" are first impressions of important unreleased software packages.* NeXTWORLD *will publish a full review with cube ratings in a future issue.



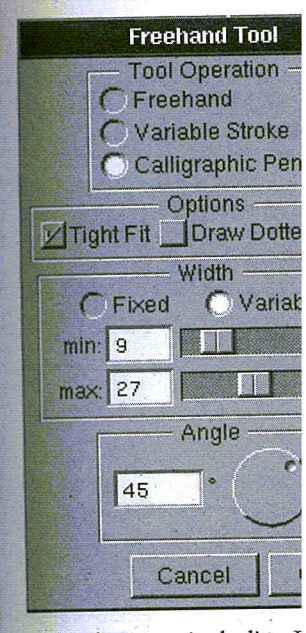
Virtuoso's toolbox is organized by function: There are tools for drawing basic shapes (the Rectangle, Multigon, Ellipse, and Line tools); drawing freeform shapes (the Freehand and Path tools); transforming shapes (the Rotate, Reflect, Skew, and Scale tools); and performing basic functions (the Pointer, Text, Knife, Trace, and Magnifying-glass tools). Most have keyboard alternatives.

Professional drawing

The Freehand tool is especially easy to use. It can be changed into a variable-weight pen for pressure-sensitive drawing or painting or into a calligraphic pen that is ideal for ornately lettered invitations (Figure 2). The Multigon tool creates polygons and starbursts while offering the user control over the number of sides and the obtuseness of the shapes.

The Autotracing Tool works best with simple TIFF images. You can also send a TIFF image to a background layer and lock the layer for manual tracing.

The program can import graphics from FreeHand and Illustrator files in Mac and PC formats, as well as NeXT formats for Illustrator files, TIFF and EPS image files, and ASCII and RTF text files. It also exports graphics to a variety



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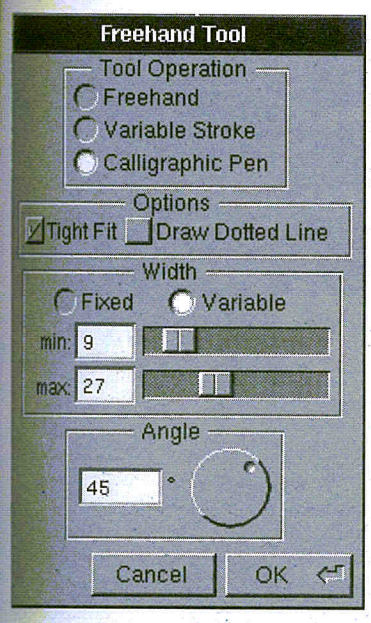

of file formats, including EPS, FreeHand, and Illustrator.

Keeping to the NeXT interface guidelines, Virtuoso's Inspector panel offers information about any object you select. You can make precise changes by changing attributes in the panel with impunity; there are up to 100 levels of undo. Editing in preview mode in full color is surprisingly fast (the program also has a keyline mode for editing). Selected objects can be magnified up to 1600 percent.

We found the methods for applying color very convenient: You can drag a color swatch into the color wells in the Inspector panel or drag a swatch from a color well and drop it into an object. You can also lock the color wells in the Inspector panel to the large color well in the Colors panel or assign a color from the Color List. Tints can be created quickly in the Tint panel (Figure 3), and you can define and name colors in the Color List and reuse them in other documents.

Also convenient is the Styles List, which lets you quickly apply fill and line styles. The program provides 20 editable PostScript lines and 20 PostScript fills, and you can add your own.

Text formatting and layout

Virtuoso excels at handling text. It provides automatic hyphenation, copyfitting control, linked text blocks, object avoidance (wrapping text around graphics), multiple rows and columns, and extensive typographic controls – just the features you'd expect to find in a page-layout program.

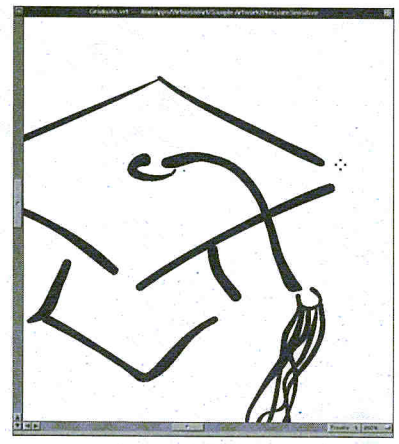

Figure 2: **The calligraphy pen option for the Freehand tool lets you set a variable width with minimum and maximum values. The calligraphy option also works with a pressure-sensitive tablet.**

The sole drawback is that Virtuoso creates only single pages. Although many advertising and packaging projects can be laid out as a single, large page or in multiple documents, it is difficult to create a multiple-page document such as a gatefold brochure.

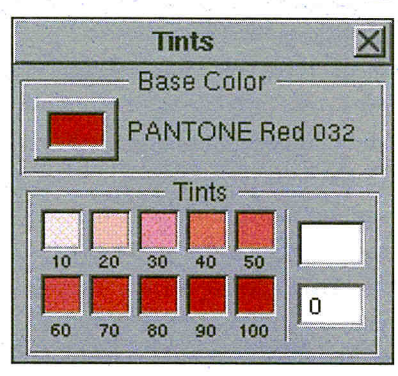

Figure 3: **The Color Tint panel can produce a swatch of any color, which can then be dragged into the document and dropped on any object.**

The program uses containers to hold text. When you select text, the container sprouts a ruler with tab stops at the top and a link box in the lower right corner. The link box turns black if there is additional text that has overflowed the container. You can link the container to another container by dragging the link box to a path, polygon, or new container. The exact dimensions of a container, as well as text insets from each side, can be specified in the Inspector panel. And you can choose to wrap text from the top of a column to the bottom or from side to side, across columns.

Users can distribute text across columns with the same number of lines in each column, and leading can be adjusted or the text optically scaled for copyfitting. With object avoidance, you can set text to run through or wrap around objects, with specified offset distances for each side of the object.

Overall impressions

With Virtuoso and Adobe Illustrator, professional illustration programs have turned a corner. They are now a great deal more than drawing tools; they are on their way to providing a complete set of single-page layout capabilities – and Virtuoso seems to have an early lead in that race. There is no doubt in our minds that Virtuoso has raised the level of functionality for illustration programs. It will be hard to beat.

TONY BOVE *and* CHERYL RHODES *are contributing editors to* NeXTWORLD *and publishers of the* Bove & Rhodes Inside Report on Multimedia and Publishing Technologies. *They can be contacted at t-and-c@toad.com.*

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Circle 51 on reader service card

Presto, Change-o

NeXT's DSP capability comes of age with MIDI-sequencing software

by LEE SHERMAN

Presto, the first MIDI-sequencing software for the NeXT, has mastered the best tricks of its competition on other platforms and added a few of its own.

Like a lot of other entry-level sequencers, Pinnacle Research's product lets you record, edit, and play music using MIDI-capable keyboards or other controllers. What makes Presto unique, though, is support for sounds generated by the NeXT's Digital Signal Processor (DSP). It is the first commercial music program on any platform to bring the power of software-based synthesis to the end user.

Presto lets you invent your own sounds and load them into the program. It also provides a rich collection of piano, bass, woodwinds, strings, voice, and percussion instruments. DSP sounds can be used independently of MIDI or mixed with the sounds coming from your synthesizer.

Nothing up my sleeve

MIDI is the Musical Instrument Digital Interface. It's a system for capturing information about musical performances, such as when keys on a synthesizer are depressed and released, or how fast they are moving. Because MIDI files store only instructions and not the actual sounds, they take up far less room on disk than a recording would. And they are easily shared among programs and platforms.

Although NeXTSTEP comes with a MIDI driver, you need a hardware interface – and a synthesizer that is MIDI-equipped – in order to make full use of Presto.

Once you've put together the hardware, making music with Presto is as easy as using a tape deck. On-screen buttons labeled Play, Stop, Pause, Record, Tempo, and Rewind control the recording session. There are also controls for skipping ahead or backwards to a specific point in the track or looping individual sections indefinitely. The difference is that you aren't recording the performance itself – you're recording a description of the performance that can be edited with a sequencer, just as a word processor allows you to edit text.

With Presto, you can create the illusion of having an entire orchestra at your disposal by layering different tracks on top of each other. You'll never be without musical accompaniment either, since you can play along with your recordings.

A-one-and-a-two . . .

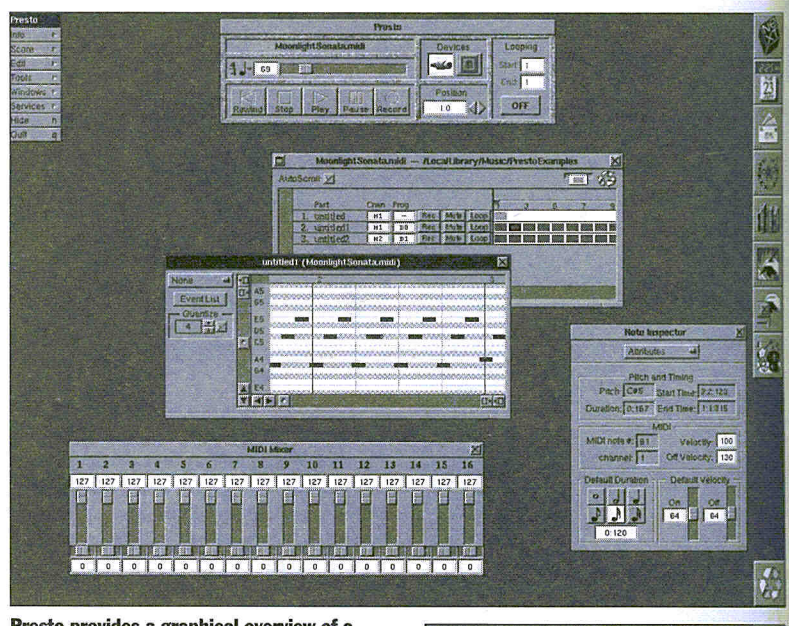
The advantages of using a MIDI sequencer to record music become apparent when you begin to edit your performance. You can replace bum notes with those that are in key, correct imperfect timing, and enter instrumental parts one note at a time, speeding them up upon playback. You can even add parts that would be physically impossible to play, such as eight hands simultaneously playing a piano. You can also substitute one instrument for another with a wave of the mouse.

The Score window provides a graphic overview of your composition. Measures are represented by rectangles laid out along a spreadsheet-like grid, with each rectangle representing one measure of music. A dark-gray rectangle indicates that there is at least one note in that measure, while a light-gray rectangle indicates that the measure is empty. Presto's measure editing is purely drag-and-drop, allowing you to move, copy, insert, merge, or replace groups of measures simply by picking them up and placing them where you want. You can even open multiple Score windows and drag measures between them. Unfortunately, the program doesn't support multiple views of the same score.

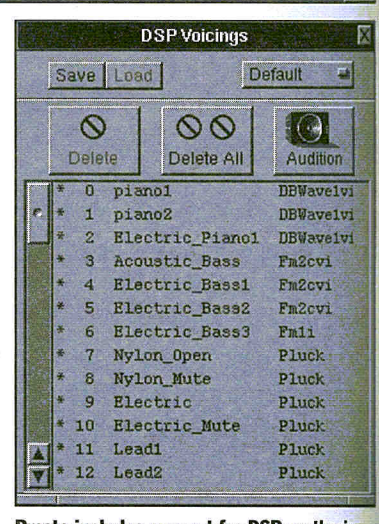
Presto provides visual cues so you can tell exactly where a measure will end up, and the window displays status messages that can keep you from moving a measure when you mean to copy it. Presto also provides an item dispenser, reminiscent of the one in Improv, for tearing off blank measures to be added to parts, and a recycler for clearing selected parts of notes.

Instead of the pop-up menus that clutter a screen, Presto makes use of inspectors for naming parts, selecting channel numbers and instruments, and deciding whether to use MIDI or DSP instruments. Double-clicking a measure in the Score window brings up the Part Edit window, in which you can edit the individual notes and controller events that make up a score.

For editing your music on a note-by-note basis, Presto uses piano-roll notation. In piano-roll notation, notes are presented as



Presto provides a graphical overview of a musical score, which gives the user precise control over individual notes through drag-and-drop editing techniques and inspectors.



Presto includes support for DSP synthesis. This panel is used to select from a collection of the DSP instruments that can be included in a composition.

Presto

beta

Innovative entry-level music program that combines MIDI sequencing with DSP synthesis. Professionals and hobbyists alike will appreciate Presto's uncluttered layout and inviting drag-and-drop approach to measure editing.

$295

Pinnacle Research, 4725 E. Sunrise Dr. #435, Tucson, AZ 85718. 602/529-1135.

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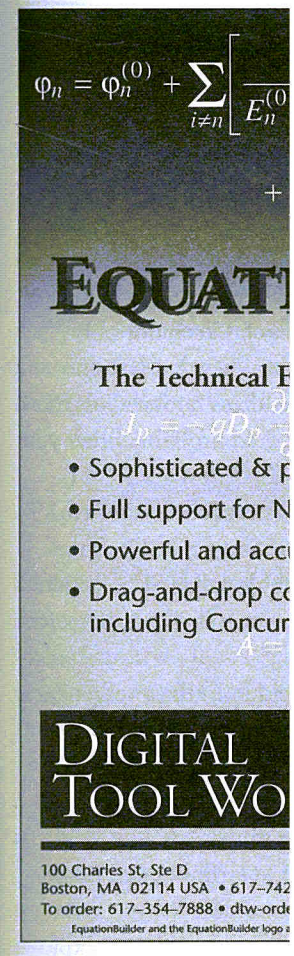

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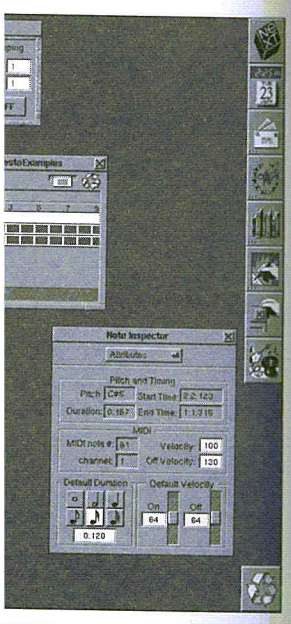

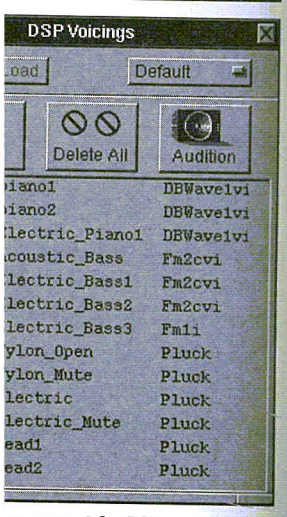

es support for DSP synthesis. used to select from a collection struments that can be included ion.

les an item dispenser, t of the one in Improv, off blank measures to be arts, and a recycler for lected parts of notes. l of the pop-up menus a screen, Presto makes ectors for naming parts, ıannel numbers and s, and deciding whether)I or DSP instruments. :king a measure in the ow brings up the Part w, in which you can edit ıal notes and controller make up a score. ting your music on a :e basis, Presto uses ıotation. In piano-roll ɔtes are presented as bars extending from left to right across a musical score. The vertical position of a note indicates its pitch, the horizontal position its rhythmic placement, and the length of the bar its duration. Editing a note's pitch or rhythm is intuitive: You simply grab the note with the mouse and drag it into a different position on the grid. To adjust duration, you click on a handle and resize the bar, much as you would do in a drawing program.

Although Presto simplifies editing by providing several views of your score, right down to the microscopic detail of individual notes, it lacks a phrase-block view, a common way of thinking about the overall composition. This macro view breaks down a piece into sections that correspond to verse, chorus, and bridge, making it easier to shift around whole sections of a score.

Electronic music is more than just musical notes; synthesizers have controls such as pitch bend, modulation, and velocity, as well as the ability to switch instruments on the fly, all of which weren't anticipated by the inventors of standard notation. Presto shows these events in a split view in the Part Edit window. Alternatively, you can choose to view both notes and events in a list format using Presto's Event List Editor. What the List Editor lacks visually it more than makes up for in the numerical precision with which you can edit a score.

Abracadabra

Musical transforms contain the real magic. Using the Transforms tool, you can transpose keys, adjust velocity, or quantize a selection to an exact musical value. Quantization allows you to shift recorded notes so that they fall exactly on the beat. If this sounds too perfect, you can use a randomizing option to maintain the human touch, a feature not typically found in sequencers in this price range.

This first release goes a long way toward satisfying pent-up demand for MIDI tools on the NeXT. An obvious addition to Presto would be support for sampling, either from the bezel microphone or an external sampler. You could then add vocal tracks and sound effects to your MIDI sequences.

Presto is also missing high-end features like algorithmic composition; automated mixdown; drawing tools for indicating events like pitch bend and fades; the ability to edit a score using standard musical notation; and support for SMPTE (Society of Motion Picture and Television Engineers) time code, so that multimedia producers can sync MIDI to video. Nevertheless, it presents the basics in a way that even professionals will appreciate.

Presto includes extensive online help – its only fault is that it assumes too much knowledge on the part of the user. We'd like to see it expanded to include a discussion of MIDI basics.

By taking advantage of interapplication communication and multitasking, Presto will be able to leverage off the capabilities of other music programs as they begin to appear, sending the MIDI information you're recording directly to a notation program for formatting sheet music or working in concert with a sample recording and editing package to provide a complete desktop recording studio. Pinnacle has pulled a rabbit out of a hat.

LEE SHERMAN *is a contributing editor to* NeXTWORLD.

$$\varphi_n = \varphi_n^{(0)} + \sum_{i \neq n} \left[\frac{H'_{in}}{E_n^{(0)} - E_i^{(0)}} - \frac{H'_{nn} H'_{in}}{\left(E_n^{(0)} - E_i^{(0)}\right)^2} + \sum_{k \neq n} \frac{H'_{ik} H'_{kn}}{\left(E_n^{(0)} - E_i^{(0)}\right)\left(E_n^{(0)} - E_k^{(0)}\right)} \right] \varphi_i^{(0)}$$

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$$A = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

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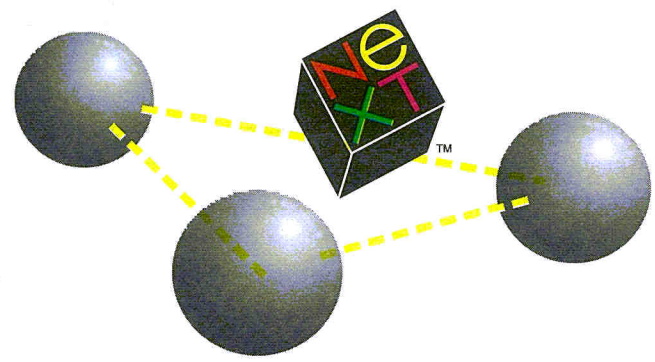

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Mesa

Lavin: The NeXT spreadsheet market is like a corner malt shop. First, there was Ashton-Tate and Informix offering plain vanilla in the form of PowerStep and Wingz. When Lotus introduced butter pecan – Improv – nobody seemed to want vanilla anymore.

Over time, however, it became apparent that users really wanted a true marriage of traditional spreadsheet and the NeXT environment. So David Pollak and Athena Design have brought a new flavor to market in Mesa. It's still vanilla, but it's creamy French vanilla.

Mesa grows directly out of the evolution of 1-2-3 on the PC (ugly, clunky, and inelegant) to Excel on the Mac and Windows (only slightly less ugly, clunky, and inelegant). By tapping the beauty and power of the NeXT environment, Mesa is the cream of traditional spreadsheets.

Barlow & Lavin

You get all the functions of 1-2-3, including full compatibility with 1-2-3 macros and direct import of 1-2-3 worksheets. It has all the tools – layout, graphing, font control, graphics incorporation – to make your spreadsheet presentations welcome in the real world. Unlike Improv's, Mesa's familiar format means that you need little or no training to perform basic tasks.

Further, this is a product that operates in the NeXT's multitasking environment. Beyond the expected copy-and-paste capabilities, you can have true real-time links to other programs and to the outside world in the form of data feeds. For users who want to customize Mesa for their specific needs, Mesa ships with its own API (application program interface). The end result is true productivity improvements for users who need a spreadsheet every day, or just one day a month.

The only problem for Mesa is that it may not be the only fancy flavor on the market for long, now that Appsoft has announced that it plans to bring PowerStep back from the dead. With the way machines are starting to sell, and with NeXTSTEP '486 shipping soon, there should be plenty of room for both.

Barlow: *Sometimes the old ways are the best. When I first saw Improv at the second unveiling of the NeXT, I was so impressed that I imagined a lot of bizdroids rushing out and buying black boxes just to get some. Then I tried it myself and found its paradigm-shattering model really hard to wrap my mind around. I couldn't tell whether it was actually that counterintuitive or if my sense of what a spreadsheet was had simply calcified permanently around the Lotus-Excel model and was no longer capable of change.*

What I kept grabbing for (and not finding in my Dock) was a plain old spreadsheet – something that would open my old Lotus and Excel files without weirdness or complaint, performing the usual functions in something like the usual way.

It's finally arrived in the form of Mesa. Mesa is just a spreadsheet. Nothing more, nothing less. Very old paradigm. If you know either Lotus or Excel, you shouldn't even need to open its manual (which is as crisp and obvious as the program itself).

It appears that it will even run your Lotus macros, though it's been so long since I've used mine that I couldn't remember where I'd stashed them in order to test it.

It's lean but not emaciated. It doesn't provide some of the more baroque features – 3-D pie charts come to mind – that are available in programs like Wingz, but I would guess that 90 percent of the features in any spreadsheet go unused by 90 percent of the users 90 percent of the time. Hey, most folks never do anything with a spreadsheet they couldn't do as well, if more loudly, using an adding machine.

Mesa's text-based flavor may remind you of an adding machine. But for that reason, it should be palatable to the bonds traders and commodities brokers who are just coming to the NeXT and whose previous experience with computing has been Lotus 1-2-3 version 2.1. Mesa is a bit of a hammer, but it's just that useful for the tasks it's likely to be put to. And it's just about as challenging to operate.

SBook

Editor's note: Because the author of this program wears another hat as a senior editor of this magazine, NeXTWORLD *will not publish a formal review of SBook. The opinions below are those of Barlow and Lavin only.*

Barlow: Whenever I've followed the bleeding edge to a new computing platform, I've always left behind some fixtures for which my shiny new environment offered no equivalent. I found this especially true as I departed the comfortable funk of my Mac commune for the upscale but largely unfurnished NeXT.

The cozy old sofa I have missed the most is something called QuickDex, a freeform (that is, unfielded) database in which I keep not only all my addresses and phone numbers but any other notes that have no obvious place to go. It also prints envelopes and address books, dials the phone, and, if its author spent the evening on it, could probably brew your morning coffee. Unfortunately, there was nothing like it on the NeXT.

One never knows whence comes salvation. Some months ago, *NeXTWORLD* Senior Editor and noted digital eccentric Simson L. Garfinkel sent me some NeXTmail with an attached executable called SBook. I double-clicked it and realized it was – or could easily become – QuickDex for the NeXT. And then some . . .

SBook was still pretty larval when I first beheld it. In the intervening months, it has become, in my opinion, as well-strung a bit-string as I've ever fed through a CPU. It is incredibly fast, efficient, elegant, intelligent, and, most of all, uncomplicated. This latter attribute is especially remarkable when one considers the cranium in which it formed.

One might say a variety of things of Simson L. Garfinkel, but no one has ever called him uncomplicated. Simson's most notable feature is the riot of electrical hair which frames his gnome-like visage, a hirsute explo-

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OTOGRAPH BY VOLDI TANNER

sion that would barely fit in a bushel basket and seems to perfectly symbolize the complexities that boil beneath it.

One way in which SBook does resemble its maker is that it's really, really smart. It can automatically tell whether the name on the first line of a record is a business or a person and sorts it accordingly. It knows the difference between an address, a phone number, and an e-mail address and places an appropriate icon next to each that, when clicked upon, will print an envelope, dial the phone, open a NeXTmail Send window, or perform other appropriate actions.

It can automatically export all your fax numbers and e-mail addresses into the NeXT's built-in lists for each. It makes labels (centering each address neatly on a label) and address books in variety of formats, including any the user might define.

It imports and exports all kinds of data, freeform or structured, and includes, to my glee, a QuickDex file translator that corrects NeXT vs. Mac keyboard-mapping inconsistencies and still works at a speed that is rapid to the point of being a little alarming. It imported and translated my two-thousand-record QuickDex file in a little over a minute.

Indeed, all of its operations seem to occur at unnatural velocities. When I type any character string in its Find window it will locate, in my megabyte-plus database, every single instance of that string in every part of every record in less than a second.

It's not just QuickDex, it's QuickDex on a six-pack of Jolt.

Lavin: *Do you have any friends with a "great American novel" accumulating in a drawer? You read the manuscript prepared to be supportive but are flabbergasted when it actually turns out to be the great American novel. I had a similar experience with SBook. Here sat my officemate Simson complaining about the lack of a decent personal database for the NeXT. At the time, I had phone numbers in super-useful Improv and WriteNow files.*

Well, one day Simson announced, "I'm going to write one for myself. I know more about this than most people, since I've used these things for more than 15 years." Yes, Simson says things like that. Anyway, I was secretly pleased, thinking a little experience with failure would bring him down a notch or two.

No such luck. The damned thing is terrific. As much as I hate to admit it, if you're tracking names, addresses, or any kind of freeform data, there is no substitute for SBook. The only thing I'd change is to use the name NeXT Marketing Vice-President Mike Slade suggested: DataFinkel.

PasteUp

Lavin: PasteUp has me thrown for a loop. It does scads of things no other program will let me do, but it gives me almost no guidance in how to do them well. It's evident that Glenn Reid is a visionary; I just wish that he would consider compromising his vision to accommodate design idiots like me.

Glenn's vision comes through loud and clear in PasteUp. The concept is freeform page layout. It's the archetypal blank page. You can do most anything with it – assuming you know what you want to do.

I generally don't shy away from this type of freedom. I can handle someone saying, "Write something," or "Here's a crowd. Keep them occupied for ten minutes." But when it comes to design, I flash back to fourth grade and red construction paper and scissors. Guess what? A cupid doesn't materialize, just shreds of construction paper.

That said, PasteUp is a breakthrough program in many ways. As the first truly object-oriented page-layout program, it treats all elements – graphics, text, or images – in the same way. The shear tool shears text the same as if it were a photograph. (In all other page-layout paradigms you shift into a special text mode to deal with text, and so on.) A side effect of this is the ability to group items that go together graphically and apply the same attribute, like width, to all of them. All changes are achieved in real time, on the fly, using the NeXT's drag-and-drop metaphor. You tweak things visually until you get them right.

Special bonuses include sophisticated text handling, like hyphenation, for a more polished document than you can get in WriteNow or WordPerfect. Also, the program offers the only way to bring in a fax, annotate all over it, and fax it back out. There are tons of details like this, and they are all superb.

A down side is that even though you can store the style of a group of attributes and objects, all this tweaking might work against a coherent look for your organization, especially if different layout artists are working together. This may not be a big deal, since the program is admittedlty for short documents and small projects, anyway.

The upshot is that the blank-page approach might limit PasteUp's utility for amateurs like me, but it leaves the heart and soul of the desktop and professional design market wholly intact. I might like to see Glenn compromise a little bit, but if he compromised for everyone, we wouldn't have this great program.

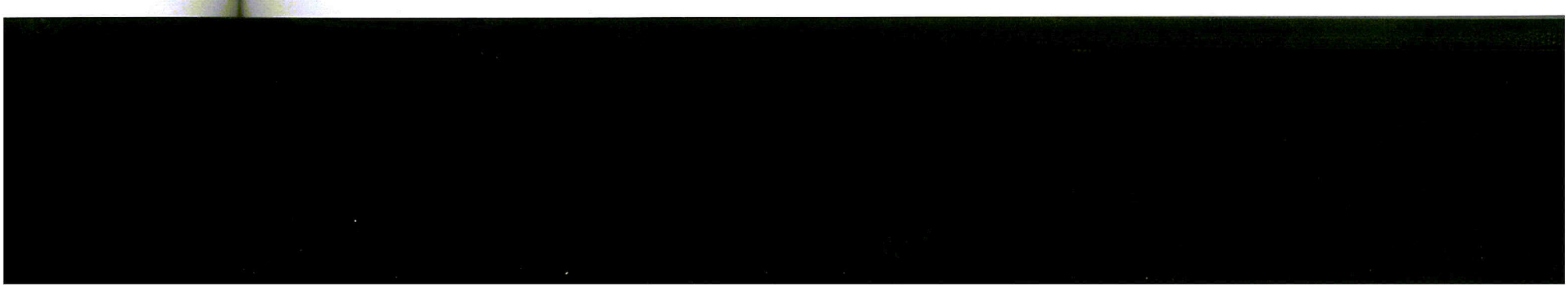
Barlow: *PasteUp appears to be a great example of the advantages of NeXT's object-oriented environment. Everything in it – characters, text boxes, graphics, external files – is an object and thus amenable to independent manipulation using the same basic tool kit.*

It is also full of neat features, some of which never occurred to you to want but might become indispensable in a hurry. You can rotate and skew anything on the screen with one handle. You can search and replace by color, font, or format. Or drag and drop styles for graphics and other objects. Or drag any sort of other file, from TIFF to spreadsheet, into a document and have it appear, properly opened, in your document. Or what RightBrain calls "infinite undo" (Command-z your way back to the Big Bang, maybe?).

Finally, it does some basic and obvious things that PageMaker still can't do after all these years, like opening multiple documents at once and allowing multiple views of the same document.

Unfortunately, as I write this in mid-July, PasteUp is not what you'd call happening software. Once RightBrain gets the bugs out, PasteUp could turn out to be a program that will make it worth buying a NeXT all by itself. I'll withhold my thumb until the software is stable.

Did DAN LAVIN *and* JOHN PERRY BARLOW *think we asked for reviews of ice cream and soft drinks? Send them e-mail at jbarlow@nextworld.com and dlavin@nextworld.com.*



City Services

While the early settlers in the City of NeXT were willing to comb the Internet for utilities that make computing life easy, the masses that followed preferred commercial services that bring utilities to the front door. Chief among the shrinkwrapped utility sets now available for NeXT is the $129 MetroTools package from Metrosoft.

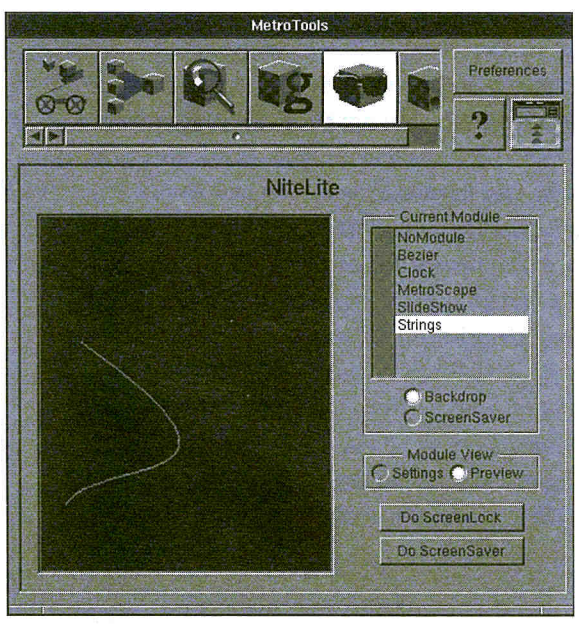
All six MetroTools utilities – a screen saver, a file locator, an application launcher, an archiver, a font installer, and a sound importer – are duplicated in shareware and competing commercial packages. But the others may be more difficult to obtain or use.

The screen saver is the product you're most likely to use every day. It relieves worries about burning in your MegaPixel Display and, optionally, provides attractive alternatives to NeXTSTEP's uniform gray background. Stepping away from your workstation, you can choose to hide your work; nosy coworkers need your password to restore the workspace. There's a choice of five backdrops and you can add the popular BackSpace modules as well.

Since *NeXTWORLD* took an earlier look at the MetroTools's Application Launcher ("Boots and Suspenders," Summer 1992), Metrosoft has added greater functionality to the Dock extender, providing quick launches for documents and applications in frequent use. The addition of small tiles (one-quarter-size application icons), simultaneous access to multiple groups of icons, and the ability to launch entire groups makes this launcher more versatile than Atherton Software Works's Engage, a popular favorite.

MetroTools's File Locater runs no faster than Workspace Manager's, but it adds optional search criteria (file size, date, time, and owner), with adjustable tolerances for approximate filename matches. It's a handy way to find all the large files eating away disk space, though you'll likely have the patience to run the File Locator only when a file is desperately misplaced.

The Archiver is useful after you've found the largest files on your hard disk and wish to group or compress them for storage elsewhere. It beats the UNIX utilities' **tar** and **compress/uncompress** for convenience. But other vendors' utilities offer the same functionality (see "Safe or Sorry," *NeXTWORLD*, Fall 1992), often via the Services menu or easy double-clicking for file uncompression. The MetroTools Archiver can't claim to be the best of its breed.



MetroTools' user interface has buttons for its six functions. A browser provides options.

The Sound Importer allows you to move Macintosh sound files to the NeXT. Just as there are more fonts and clip art for the Mac, there are also more sounds. This utility is a great leveler; the truly perverse can substitute the Apple Programmers and Developers Association's signature dog-cow "moof" as their NeXT system alert.

MetroTools's Font Installer is the most useful utility for the new NeXT user. A new NeXT needs fonts – badly – and few are available in NeXT's slightly special format. Now that NeXTSTEP 3.0 reads Macintosh floppies, it is especially easy to use the Font Installer to twist Macintosh-format Adobe Type 1 typefaces into a format that a NeXT can use. You don't need to read a manual: Just drop the font file into the Font Installer icon well and click. Unless you track down the elusive mfrc freeware utility, the Font Installer justifies the full $129 price of the MetroTools grab bag. One caution: Macintosh-formatted PostScript fonts don't always conform to the Adobe Type 1 standard. Not every Mac font will work.

These utilities all work as advertised. With accompanying toll-free technical support, they are a welcome addition to the tool box for NeXT users who prefer utilities delivered to their door instead of roughing it on the Internet.

by DANIEL MILES KEHOE

MetroTools

Metrosoft's six tools are useful, and though similar utilities are all available elsewhere, convenience and value recommend this bag of tricks.

$129

Metrosoft, 712 Vanitie Ct., San Diego, CA 92109. 619/488-9411, 800/851-8665.

Having a Ball

For users who have limited desk space or a preference for a stationary mouse, CH Products has adapted its RollerMouse trackball to plug into a standard NeXT keyboard. The alternative input device works as expected and provides a variety of customizable features. After extended use of the device by several *NeXTWORLD* staffers, however, I have some concerns about its ergonomic design.

The housing and ball have been given the black treatment but are otherwise the same as their white cousins for PCs and Suns. The two-inch trackball with its pair of buttons on either side handles smoothly, while the sturdy housing withstands the everyday desktop war zone. A bundled application, Max.app, allows fine-tuning of the trackball movement, though for coarser settings the standard NeXT Preferences panel still works.

Switches on the bottom of the device allow you to exchange right- and left-button functions, turn off the click-lock feature, double or halve the cursor speed as set by Preferences, and reverse the vertical and horizontal directions.

The RollerMouse handles normally with standard settings but becomes unwieldy when the cursor speed is doubled. Max.app heightens sensitivity at the increased speed by allowing the user to set, on a graph, 14 points of acceleration; the only way to find the settings you like is to experiment. → PAGE 70

RollerMouse Trackball

A solid trackball with superior sensitivity and speed. Users should test for ergonomic comfort before they buy.

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You're in marketing. You know what a teaser ad is. It's what you run when your product is not quite there yet, but you don't want your prospects to jump to the competition. That's where we are.

We're about to introduce a new page layout program for NeXT called Archetype Page.™ It's a great product, better than the competition. And it's modular. So you can add whatever features you need, whenever you need them. As a result, Archetype Page is infinitely more flexible.

When will it be ready? Soon. So send in the coupon provided, or call us at 1-800-723-2724 or 617-890-7544. And find out why, despite this ad, Archetype Page is much more than a tease.

To receive more information on Archetype Page just fill out this coupon and mail to:
Archetype Page,
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Archetype inc. Page™

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Circle 62 on reader service card

Waterproof Markup

Specifications. Reports. Contracts. Bids. Every business has documents that must pass through an approval cycle. Traditionally, the revision process is done using hard copy, with each reviewer marking up the document with comments and symbols. Other organizations circulate the actual computer file, with changes inserted in the original text.

Redmark, from Epitome, introduces the notion of the paperless review cycle to the NeXT platform. With Redmark, reviewers mark up what amounts to a transparent overlay that sits on top of a PostScript screen image of the original document. Similar in concept to Mainstay's Markup on the Macintosh and Capsule Codeworks's Red Pencil for Windows, Redmark adds the advantages of NeXT's workgroup-computing environment. While its interface is more complex than it needs to be, we think Redmark will prove useful in organizations flexible enough to adapt their work procedures to it.

Redmark

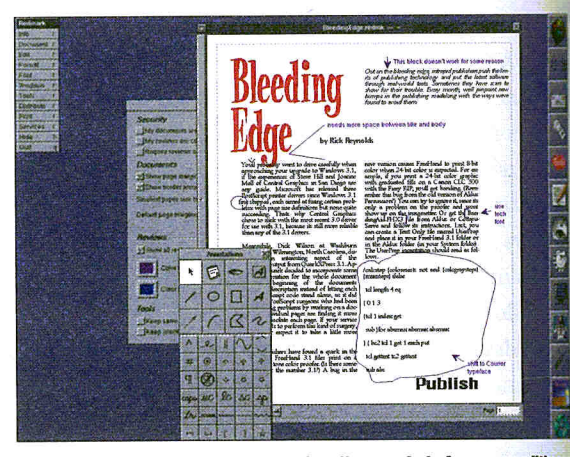
Easy enough to use and professional in approach, this document-mark-up package manages to match, but not improve on, document review on paper.

$285

Epitome, 716 Summit Lake Ct. #100, Knoxville, TN 37922-3156. 615/675-0910.

To use Redmark, you must first create a saved PostScript file for the document you wish to annotate. That's easy enough to generate from NeXTSTEP's Print panel – just select Save. Redmark can also use document images produced on non-NeXT computers, as long as the application produces conforming PostScript or EPS files. Once you have the PostScript file, launch Redmark, select a New Review, open the PostScript file, and you're off.

Redmark's tools draw on an invisible overlay located above the document to be edited. The program provides 42 different tools, including common proofreading symbols as well as basic graphics. Drawing, or "marking," with the tools is much like using a drawing program. You may also attach text notes and voice annotations.



Redmark provides a palette of proofreading symbols for group editing.

More than one reviewer can edit the same document, and each review layer is tracked separately – with any color, if you wish, although red ink is the default. You can display previous reviews in a different color. Marked layers can be printed individually or together with the document.

Since the document in the illustration shown already contained the color red, I chose to mark it up with purple ink to preserve some contrast. Other reviewers' layers could show up in other colors. Each layer can be managed separately, individually secured with a password, and set to be visible or invisible to other reviewers.

Beyond the basic editing tools, however, the user interface begins to lose its clarity and simplicity. With four inspector panels and three separate tools for "distribution," this application lacks the clean, smooth interface of programs such as Adobe TouchType.

The main advantage of Redmark over paper markup comes in distribution. A document annotated with Redmark can be sent via e-mail, shared over a network, passed on a diskette, or (like those on paper) faxed. Other than this and a few other advantages, however, the program's functions duplicate, rather than enhance, the process of marking up hard-copy documents. Organizations looking to standardize the document-review process will find Redmark useful; others may find it more of a solution looking for a problem.

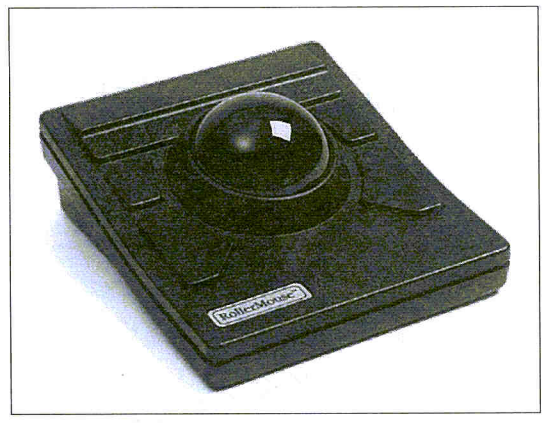
by RICK REYNOLDS

→ Having a Ball

It took me several days to find a response curve with which I felt comfortable, but the increased responsiveness made me loath to return to my mouse.

The click-lock feature is useful though somewhat nonintuitive. By pressing a lock button, you can remove your finger while still having hold of your window, icon, or highlighted element. You can press any button to release. Once you've added click-lock to your button vocabulary, you can answer the telephone without accidentally dropping a file into the wrong folder.

Comfort and ergonomics is a critical issue with any input device.



The RollerMouse is the first trackball marketed for the NeXT.

Unfortunately, using the RollerMouse became uncomfortable for me after a few days. Other *NeXTWORLD* staffers tried out the trackball and reported mild wrist and arm soreness. We don't know how to account for this, since RollerMouse versions for other platforms have received excellent reviews with few complaints.

Our experience probably stems from having to mouse around in the NeXT user interface far more than we would have to on other platforms. Oddly, I found that turning the trackball around, cord to the front, was a more comfortable position for me. Reversing the horizontal and vertical directions permitted this adjustment while maintaining normal cursor movement.

Comfort is a subjective issue, so users should try the RollerMouse for themselves before reaching a conclusion about its ergonomics. A NeXT-compatible trackball fills an important void in the NeXT product universe. With the ADB compatibility provided in newer NeXT systems (see "Ergo Style" in this issue), however, there will be many available input-device options. For those unwilling or unable to convert to the new systems, RollerMouse from CH Products provides an alternative worth considering.

by KRISTIN DYER

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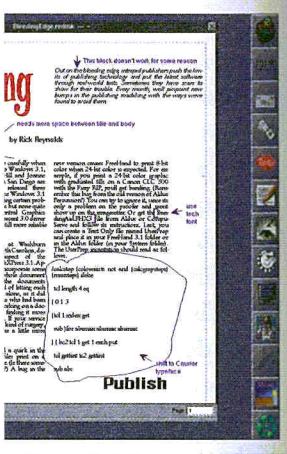

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ISTIN DYER

V-DAY AT NeXT

VERSANT DELIVERS THE FIRST ODBMS ON NeXT. SAVE OVER $6000 IF YOU ORDER BEFORE 1993.

We're the Versant Object Technology development team, and we're betting more than mere money that our object database management system — ODBMS — is the hottest, most robust software of its kind. We're putting our professional reputations on the line.

Sure, if you order the VERSANT ODBMS for your NeXT computer by December 31st, you'll get $7,200 worth of this planet's fastest ODBMS (or any kind of DBMS), along with our Objective C interface, for only $995. To us, that's the second most important part of this ad.

The most significant point: If you think any of us would personally permit ourselves to be used in false or even exaggerated advertising, then think again.

We're not your average group of yahoos. Our developers include the architects of Informix, Ingres/Star and dBASE, the author of ORACLE Server for OS/2, a former member of Oracle's kernel development team, as well as key developers from IBM and Sybase. So we know we've got the best thing on the planet, because we know everything else ... inside out.

Why consider an ODBMS? Have you ever wondered why you don't see relational DBMSs in workgroup applications, network management or complex document production? Just try using relational joins to produce a nested bill of materials for an online application, or to manage multiple versions of a shared document, and you'll have your answer. Relational DBMSs can't store complex information in its true form. They have to either break it into tables or store it as a "blob" with no structure at all. VERSANT *encapsulates* your object with all logic intact. Astounding performance is just the beginning of our story.

We're proud to offer our ODBMS to NeXT developers, and we think you should take us up on our $995 offer. Or at least attend an ODBMS seminar, where you'll learn everything you need to know about evaluating and using an object database.

Call 1-800-VERSANT or EMAIL to *info@versant.com* via Internet. Seating is limited, because we'd like to give your questions individual attention. So call, today.

VERSANT SEMINAR CITIES/DATES:

Dallas	Oct 27
Denver	Nov 10
Houston	Oct 28
Los Angeles	Oct 29
Minneapolis	Nov 5
New York	Oct 14
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Washington, D.C.	Oct 27

VERSANT
Object Technology

4500 Bohannon Drive • Menlo Park, CA 94025
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NeXTConnection™

Why NeXT owners keep calling NH (toll-free).

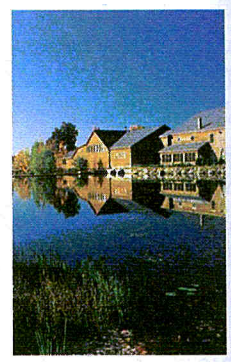
Much like you, Casey and Jerry spend their days surrounded by NeXT hardware and software.

We can save you more than just money.

We offer one-stop shopping for everything you need for your NeXT computer—whether you're an individual user or a corporate/educational/government buyer. Our prices are the lowest you'll find. And we deliver every in-stock non-COD order overnight for only $3 (continental U.S. only).

Just as importantly, our toll-free technical support services can save you a lot of time and frustration. You see, we don't just sell NeXT software and peripherals, we use them. And we're in regular contact with the people at NeXT as well as most companies developing products for NeXT computers. All of which puts us in a unique position to help you overcome any confusions, illusions, obfuscations, or complications you encounter on whatever upgrade or enhancement paths you travel.

Our headquarters are located in the old "Christmas Trees Inn" in Marlow, NH.



We also have offices in a converted sawmill across the mill pond.

When it comes to the products we sell, if there's a shortcut, we've probably heard of it; if there's a problem, chances are we've already dealt with it; and if there's an incompatibility, we can help you resolve it.

So next time you're trying to figure out how to get the most out of your NeXT computer, give us a call. Because our goal is to be your source for NeXT products *and* to provide the information you need to get the most out of them.

FASTE

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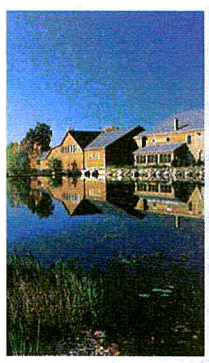

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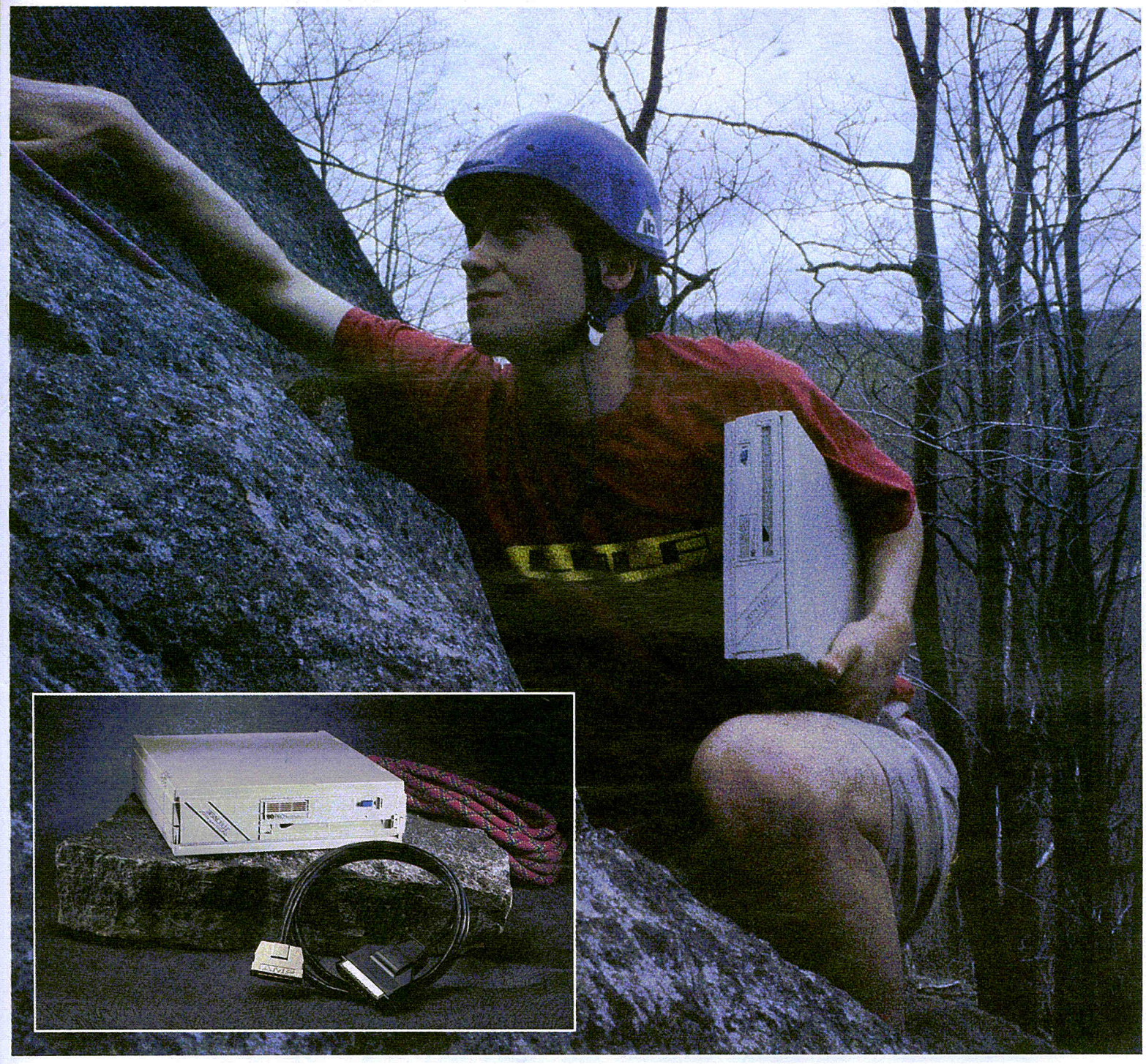
NeXTConnection™



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FASTER. QUIETER. COOLER. AND LESS EXPENSIVE.

BERNOULLI TRANSPORTABLE PRO

The 90 turns PRO. The new **Bernoulli Transportable 90 PRO** delivers higher performance *at a lower price* than Iomega's previous popular Bernoulli drives. That's right—this is an even better version of the removable drive that's won the *Byte* Readers' Choice and *InfoWorld* Product of the Year.

The new Transportable PRO provides an effective access time of 18 ms and can be daisy-chained with additional SCSI drives. It still weighs just over eight pounds and runs quieter and cooler than ever. Best of all, our price is $199 less than before! And when you send in the warranty card, you'll get a *free 90 MB Cartridge.*

Bernoullis feature an innovative design that makes a crash virtually impossible because the flexible medium is suspended below the fixed read/write head—the two don't make any contact. And **Bernoulli Gold Standard Removable Disks** are manufactured from extremely rugged polycarbonate cases to withstand shocks up to 1000Gs. Buy your cartridges in the **90 MB Tri-Pack** from us and enjoy unlimited storage for well under $2 per MB.

All it takes to plug your NeXT into unlimited Bernoulli storage is a NeXT Interface Kit. Interface kits are also available for Macs and PCs, so you can connect to virtually any other host machine. Plus, like NeXT computers themselves, the Bernoulli 90 MB Transportable switches automatically from 110 to 220 power, so you can take it *and use it* anywhere.

Looking for the speed of a hard disk, the portability of a floppy, and the unlimited storage of a tape drive? You're looking right at the PRO. Enhanced Bernoulli performance at a great new low price.

IOMEGA ... 1 year warranty

6499	Bernoulli Transportable 90 PRO	**$679.**
2530	Bernoulli 90 PRO Cartridge	**149.**
2467	Bernoulli 90 PRO Cartridge *(tri-pack)*	**439.**
7151	NeXT Interface Kit	**65.**
2481	Care Kit	**49.**

Call 1-800/800-NeXT to order.

NeXTConnection™

LOTUS REINVENTS THE SPREADSHEET.

LOTUS IMPROV

Look at your data in a whole new light. What happens when you give the creators of the world's best-selling spreadsheet an 040 processor and 8 MB of RAM and let them improvise to their heart's content? You get Lotus Improv, a revolutionary spreadsheet for analyzing, viewing, and presenting your data in ways never before possible.

Improv's unique dynamic-view feature lets you see the same data in multiple ways to explore data relationships and prepare targeted reports. Just use the mouse to rearrange your spreadsheet and get a whole new view instantly, without any re-keying. You can actually work with 12 different dimensions of data at once, displayed in 2D or 3D format.

Improv lets you use plain English to define cells and create formulas (e.g., "Dollars = Tons x 12.5"). So your spreadsheets document themselves and are easy to modify and re-use. For complex formulas, you can call on a host of built-in *Lotus 1-2-3*-style functions. All of which makes it easy to build spreadsheets from scratch. You can also use the extensive collection of prepackaged templates and/or import existing *1-2-3* files directly.

Improv lets you combine graphs, texts, images, and even sound with stunning clarity and resolution that take full advantage of NeXT. But how good is it , really? *Byte* (10/90) wrote, "Improv knocked me out." *PC World* (11/90) called it "a stunningly simple approach to organizing complex data." *What Micro? Magazine* (UK, 4/91) awarded it "Most Innovative Product 1990." And *InfoWorld* (10/91) wrote, "Improv is an exciting alternative to traditional spreadsheet programs...it's one of the most innovative programs we've seen in some time."

And for a limited time, Lotus is offering a deal that any number cruncher will appreciate. Buy both Improv and Insignia Solutions' *SoftPC* (see opposite page) at the same time and save $129!

Lotus Development

9794	Improv 1.0	$499.
1792	Improv/SoftPC Special	729.

Latest versions only.

Sof

"Ranks as one of the most ir NeXT." That's what *NeXTWor* because it allows you to run vi right on your NeXT system, *w* Which means it protects your software and training and give 50,000 MS-DOS applications

Whether you're using a spe file, or want an easier way to g speaking) with your PC-based those platform barriers in a si

SoftPC duplicates an IBM F

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OPEN THE DOOR TO DOS.

SOFTPC

"Ranks as one of the most important programs for the NeXT." That's what *NeXTWorld* (4/91) said about **SoftPC** because it allows you to run virtually any MS-DOS application right on your NeXT system, *without any additional hardware.* Which means it protects your investment in existing MS-DOS software and training and gives your NeXT access to the over 50,000 MS-DOS applications currently on the market.

Whether you're using a specialized PC program or data file, or want an easier way to get along (technologically speaking) with your PC-based co-workers, SoftPC will leap those platform barriers in a single bound.

SoftPC duplicates an IBM PC/AT with 80286 and 80287 processors. It lets you access two hard drives, comes with MS-DOS 3.3 (you can install 4.0), and provides support for EGA and CGA video modes in monochrome and color. It can also support two RS-232 serial ports and two parallel ports that can be directed to NeXT serial ports or to any UNIX device, process, or file. In other words, all your NeXT modems, printers, floppy drives, and other serial peripherals can be used by your PC program. Plus your NeXT keyboard and mouse can function as a 101-key AT keyboard and Microsoft Mouse, respectively.

When it comes to performance, SoftPC and NeXTstep make a great team. You can run multiple DOS windows and even run NeXT and DOS software side by side. Sharing files is as easy as cutting and pasting. There's also support for EMS 4.0 expanded memory—in fact, SoftPC can open up 32 MB of RAM, enough for even the most RAM-intensive applications. Note, however, that while SoftPC will work on any system running NeXTstep 2.0, a 68040 processor is recommended.

The power of the NeXT. The application library of DOS. That's SoftPC.

Insignia Solutions

1456	SoftPC 2.05	**$329.**
1792	Improv/SoftPC Special	**729.**

Call 1-800/800-NeXT to order.

NeXTConnection™

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NeXTConnection™

THE GRAPHICS TOOL THAT SHOWS THE WAY.

DIAGRAM!

Now you can show exactly what you mean. Diagram! is a smart, general-purpose graphics tool designed for business graphics and technical drawing. When it comes to graphically describing information, no other application matches its power and flexibility.

By taking a new approach to creating graphics, Diagram! is far faster than conventional drawing tools. Users can drag and drop graphical elements into their documents without selecting different tools for drawing and editing. With Diagram!'s user-extensible palettes, frequently used drawing symbols are only a mouseclick away. And when it comes to editing and revision, no other drawing tool even comes close—lines and text labels automatically redraw themselves, ending hours of revision headaches. Now you can concentrate on ideas rather than the mechanics of drawing.

Diagram! is also an ideal tool for developers of "mission-critical" custom apps who want to draw initial plans and requirements through CASE drawings. Data flow and entity relationship diagrams are made easy—and the extensible palettes even support custom or in-house design specification systems. Diagram! also speeds common documentation tasks such as adding descriptive callout text to screen shots or interface mock-ups.

With its ability to link files and applications to drawings, Diagram! is also the perfect tool for integrating and navigating your whole world of information. Double-clicking links in Diagram! documents brings up spreadsheets, word processors, or other NeXTstep applications. To include EPS and TIFF images, just drag and drop. And, of course, images generated in Diagram! can be easily copied and pasted into other applications—like *Concurrence* (see opposite page).

Diagram!, the graphics program designed for people who use them every day.

Lighthouse Design, Ltd. ... 60 day MBG

8621 Diagram! 1.1 ..... **special offer $239.**
8686 Diagram! 2.0 *(requires NeXTstep 3.0)* ..... **395.**

No hidden charges.

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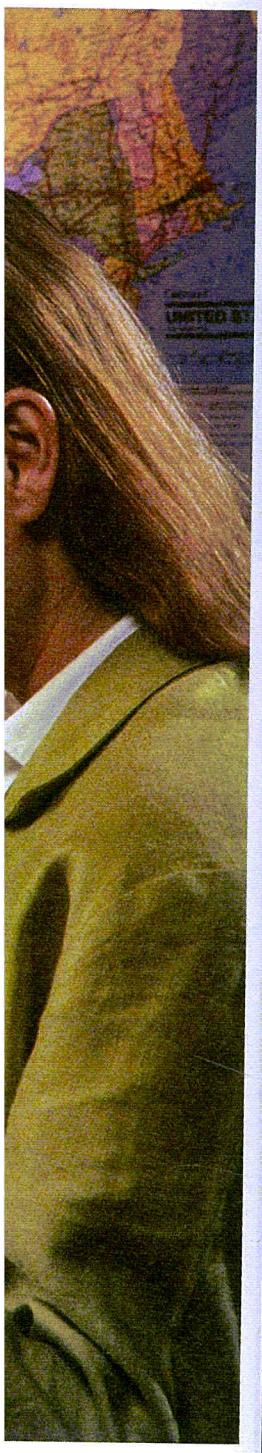

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XTstep 3.0) ..... 395.

POWERFUL PRESENTATIONS COME TO NeXTSTEP.

CONCURRENCE

"Worth the price of a NeXT all by itself." That's how John Barlow described **Concurrence** (*NeXTWorld* Spring '92), NeXTstep's first general-purpose presentation and outlining application, and one of the major highlights of the January '92 NeXTWorld Expo. Created by the same team behind the best-selling *Diagram!*, Concurrence is the tool for anyone in the business of communicating through presentations.

Concurrence's outliner is built for brainstorming. The collapse and expand capabilities, drag-and-drop text, rulers, and labels make it a breeze to create even the most complex outlines. Plus, with the built-in spell checker and automatic topic formatting features, you can get professional-quality results immediately. You can even use multiple views to create several versions of the same outline, and modify them all simultaneously!

Just push a button to hot-link a presentation to your outline. With its voice-overs and drag-and-drop graphics, Concurrence makes multimedia presentations on your NeXT a reality today. To bring the true power behind NeXTstep to your Concurrence presentations, add file links from other applications (such as Diagram!) and choose from an impressive array of transition effects. You can also create multiple versions of the same presentations, using different fonts, colors, and backgrounds—they'll track each other word for word. In no time at all, you'll be preparing high-impact presentations for delivery across your entire organization!

And when it comes to quality output—whether it's viewgraphs, 35mm slides, or overheads—just hook your NeXT to any PostScript output device or send your Concurrence documents via NeXT Mail to one of Lighthouse's qualified service bureaus. As the review in *NeXTWorld* (Summer '92) put it, "Concurrence is a compelling piece of software that NeXT users won't want to live without."

Lighthouse Design, Ltd. ... 60 day MBG
2409 Concurrence 1.0 ..... $795.

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Call 1-800/800-NeXT to order.

WINGZ

It takes spreadsheet power to new heights. Wingz is *the* easy-to-use, high-performance graphic spreadsheet for business and technical professionals. You can combine numbers, words, charts, and graphics in one window and print to one page—all with one product. The Wingz worksheet is 32,768 rows by 32,768 columns (more than a billion cells) and includes over 140 built-in functions, 2D and 3D charts, and support for as many colors as your system can display.

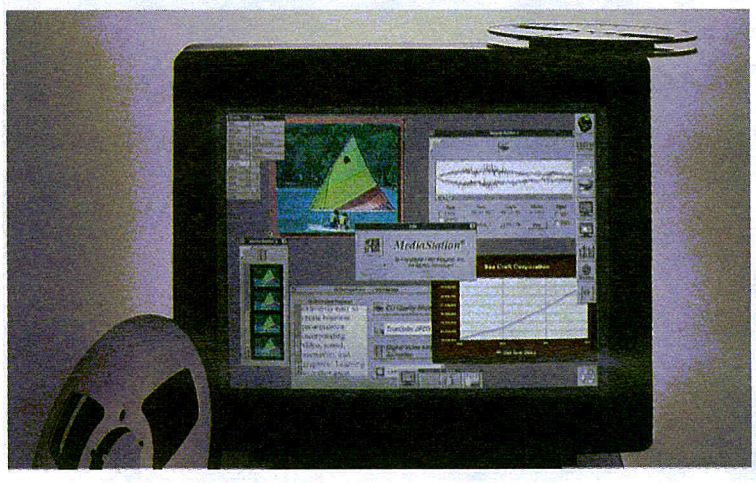
Wingz includes HyperScript, an English-like event-driven development environment, and DataLink, an SQL database access tool. HyperScript was written specifically for graphical application development and allows you to place functional buttons, scrolling lists, and other controls right on the worksheet. And with its built-in LEARN mode, even novice users can create their own applications or customize the Wingz environment quickly and easily. DataLink, which was written in HyperScript, gives you point-and-click access to data in Informix SQL databases without having to know SQL. Just point and click at the data you need—you never have to leave Wingz' friendly graphical environment. DataLink also includes a function library so you can build custom front-end applications for your SQL database and Executive Information Systems (EIS).

Other features include powerful text capabilities—including fields for free-floating text on the worksheet, with multiple text-processing options and attribute settings—and the ability to import/export Wingz graphics as EPS images.

Minimize your reliance on MIS and create your own applications and reports with Wingz!

Informix Software

3332 Wingz 1.1AB ..... **$469.**



MEDIASTATION

The power of a traditional database. Combined with advanced multimedia technology. Use **MediaStation** to add pictures to your personnel records. Or music to a teaching file. Or maps and animations to an interactive training system. In other words, it lets you capture, search, and organize data from multiple media, and then generate reports and presentations—all in one coherent, integrated application.

MediaStation supports high-res image scanning, CD-quality sound recording and editing, frame-by-frame animation, and DSP audio devices. Plus it can function as a multimedia file server over a high-speed Ethernet network, complete with password protection. Imagine the possibilities...

Imagine Multimedia, Inc.

1396 MediaStation 2.1 ..... **$495.**
1397 MediaStation *(5 pack)* ..... **2199.**
1398 MediaStation *(20 pack)* ..... **5499.**
1400 MediaStation *(Educational)* ..... **295.**

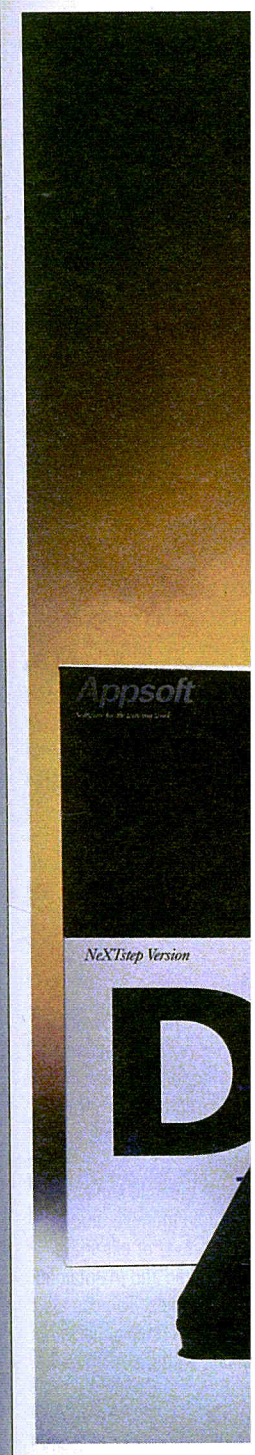
EXODUS

eXodus leads the way to the promised land of X and NeXTstep integration. Applications using the X Window System are seamlessly integrated into NeXT's remarkable graphical user environment with eXodus. Use it to connect to X applications on any host that supports TCP/IP—Sun, HP, IBM, DEC, etc.—or run X programs installed directly on your NeXT. eXodus allows NeXTstep and X apps to run simultaneously, side by side. So you can maximize your NeXT investment and training while saving the cost of additional X terminals.

eXodus operates on NeXT computers running NeXTstep 2.0 or later and supports the built-in TCP/IP and Ethernet standards. It's easy to install, and no special hardware or software is required! The package is based on X11, Release 4 of the X Window System from MIT, and comes with some basic X programs to help you get started. From the same people who developed eXodus for the Macintosh.

White Pine Software

6316 eXodus 1.0 ..... **$239.**



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POWERFUL WORD PROCESSING AND DRAWING FROM APPSOFT.

APPSOFT

Powerful word processing for NeXTstep. Simplicity, ease of use, and power: everything comes together in **WriteNow** 2.1, developed especially for NeXTstep. Format entire paragraphs, pages, and documents with a single stroke. Bring in graphics effortlessly. Control text, fonts, and spacing for the right look. WriteNow makes word processing intuitive so you can concentrate on what's important: your message.

WriteNow is loaded with powerful features. Graphics manipulation, headers and footers, multiple columns, line spacing, mail merge, spell checking, search and replace, character and word counting, pagination, and date insertion—with all this at your fingertips, what more do you need? How about free Adobe typefaces? For a limited time, WriteNow comes with Tekton, Century Old Style, and Freestyle Script plus *ClickArt* Images from T/Maker, all *free* (a $200 value).

The business drawing solution for NeXTstep. With **Appsoft Draw**'s simple interface, powerful drawing tools, and multi-page capabilities, you'll be creating effective presentations, multi-page newsletters, and professional looking artwork in a flash.

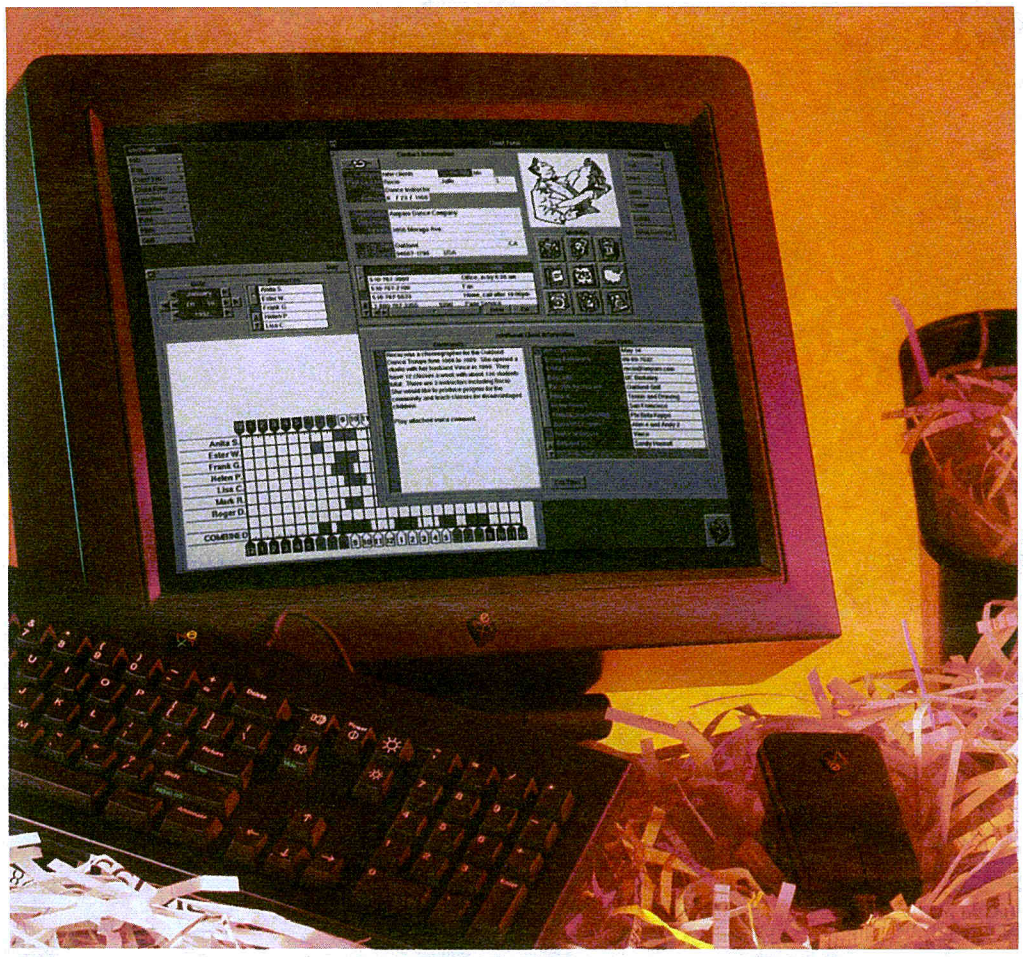
Appsoft Draw's comprehensive tool palette offers a host of drawing tools for fast, interactive control of lines, arcs, rectangles, polygons, beziers, 24-bit color EPS and TIFF images, and much more. You get complete control over text: change fonts, kerning, width, and justification; scale and rotate text to any size or angle; or wrap it to curves or pre-set dimensions. Special effects like gradients, patterns, arrowheads, line sizes, and styles make for stunning graphic designs.

With all this power, you don't need to be a master to create top-quality illustrations, maps, presentations, and slides—all you need is Appsoft Draw.

Appsoft ... 60 day MBG

4128	WriteNow 2.1	**$159.**
4997	WriteNow 2.1 *(5 pack)*	**739.**
4465	Draw 1.02	**299.**
7028	Draw 1.02 *(5 pack)*	**1295.**

Call 1-800/800-NeXT to order.



Who's Calling?

Clear the Desk! Just add **Who's Calling?** to your NeXT computer and forget about traditional Rolodexes, phone logs, message pads, and calendars. You'll have a fully automated client management and scheduling system with modules for tracking client information and conversation histories and sending live network messages. Since it's on your NeXT, you'll be able to attach sound, images, and documents to client records. And for your own special requirements, you can add an unlimited number of custom data fields that are user definable and can also be queried.

Program features will remind you when to call a client (Calendar), make the call for you (Speed Dialer), provide you with complete data on the person you're talking to (Conversation Manager), and plan the next callback (Tickler). On a NeXT network, you can send live messages to other users, schedule group meetings, and have multiple users query a central database.

If your calls are billable, Who's Calling? will automatically calculate client billing from the length of the call. In addition to billing logs, it will also generate mailing labels, client lists and conversation logs, and display or print upcoming events in daily, weekly, monthly or six-monthly view. The program even facilitates exporting and importing of data. It's everything you need to always know Who's Calling.

Adamation ... 30 day MBG
3357 Who's Calling? 2.5 ..... **$295.**

Objective Technologies

No more dated data. Objective Technologies' new **OTProvide** automatically links your database with your *Improv* spreadsheets giving them immediate access to the current data. Every time you open a spreadsheet, the latest data is imported to refresh the model so you can be confident that your calculations are based on the most up-to-date information.

OTProvide also lets you browse through multiple servers, simply by pointing to the data you want. Join multiple tables across databases, specify sort keys, and include or eliminate duplicate rows. Your queries can then be stored and maintained and their results can be loaded into *Improv* models. You can also drag queries out of OTProvide and into any NeXTstep application.

Version 1.0 requires *SYBASE* and *Improv* with the API Toolkit. Version 2.0 will also access *Oracle* databases and will be released at the same time as NeXT's DBKit.

SqlBuddy, the newest tool from OTI, is a user-friendly interface for relational databases. Also try Objective Technologies' developer tools designed to enhance developer efficiency and consistency: *GraphPalette* (tools for graphing data in custom applications), *MathPalette* (to create links to *Mathematica*), *SmartFieldPalette* (data input fields that restrict and format input), and *ChooserPalette* (which provides management functions for selection lists).

Objective Technologies

3282	OTProvide 1.0	**$699.**
7142	SqlBuddy *(floating license)*	**399.**
9344	[OT Palettes: 2.0] Graph	**1259.**
9346	[OT Palettes: 2.0] Math	**650.**
9345	[OT Palettes: 2.0] SmartField	**650.**
9347	[OT Palettes: 2.0] Chooser	**429.**

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Adamation ... 30 day MBG
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Professional Software
9357 Objective DB Toolkit

Corporate, educational, and government accounts welcome.

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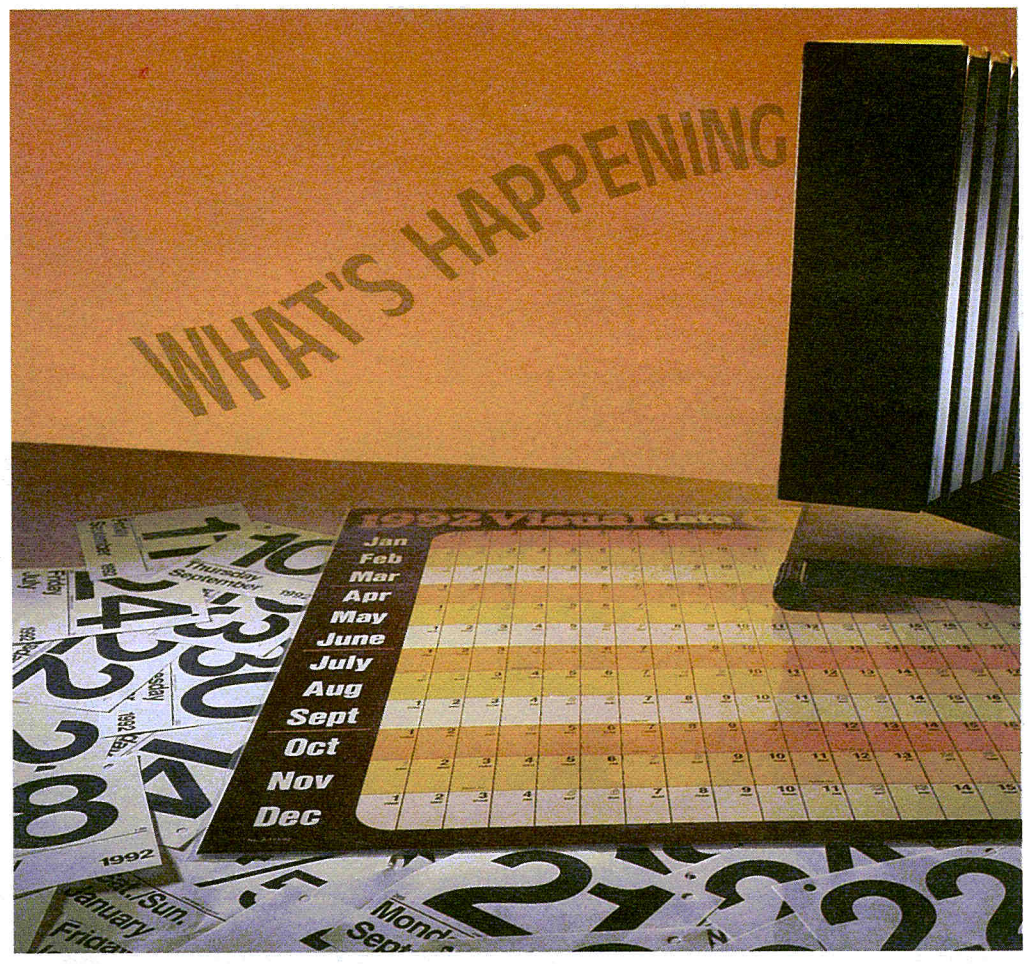
What's Happening

Here's the solution for group scheduling. Get yourself—and everyone else—organized with **What's Happening?**, the networked group calendar manager that can handle anything and everything, from reminding you of your anniversary to organizing the Democratic National Convention. You can manage multiple events, people, projects, and resources and create calendars and ticklers (one time or recurring). Tag any event with documents, images, or any other type of file.

Say the national sales conference is coming to town. Block out the times and dates on the calendars of everyone involved. Enter the meeting rooms available and their itineraries and keep track of the registrants for each event. Then assign and reassign rooms as necessary. Attach the latest updates to individual calendars and enter any site changes as appropriate. Use the relational database technology of What's Happening? to centrally keep track of the various projects and their deadlines: display construction, entertainment contracts, rentals, media presentations, and more.

You won't have to worry about missing a date, a lunch, or a call—with What's Happening?, your system will actually speak up and remind you of everything you've scheduled. Need to have various levels of network security? Events can be private, readable, or writable. Last minute change? Pull up all the affected calendars on your screen at one time and you'll see what's possible and what is simply not. (While you're at it, remember to attach the file with the president's speech to his calendar.) All set? Then print and distribute the final calendars and schedule some time to practice your "It was nothing" smile.

Adamation ... 30 day MBG
6817 What's Happening? ..... **$219.**



Objective DB Toolkit

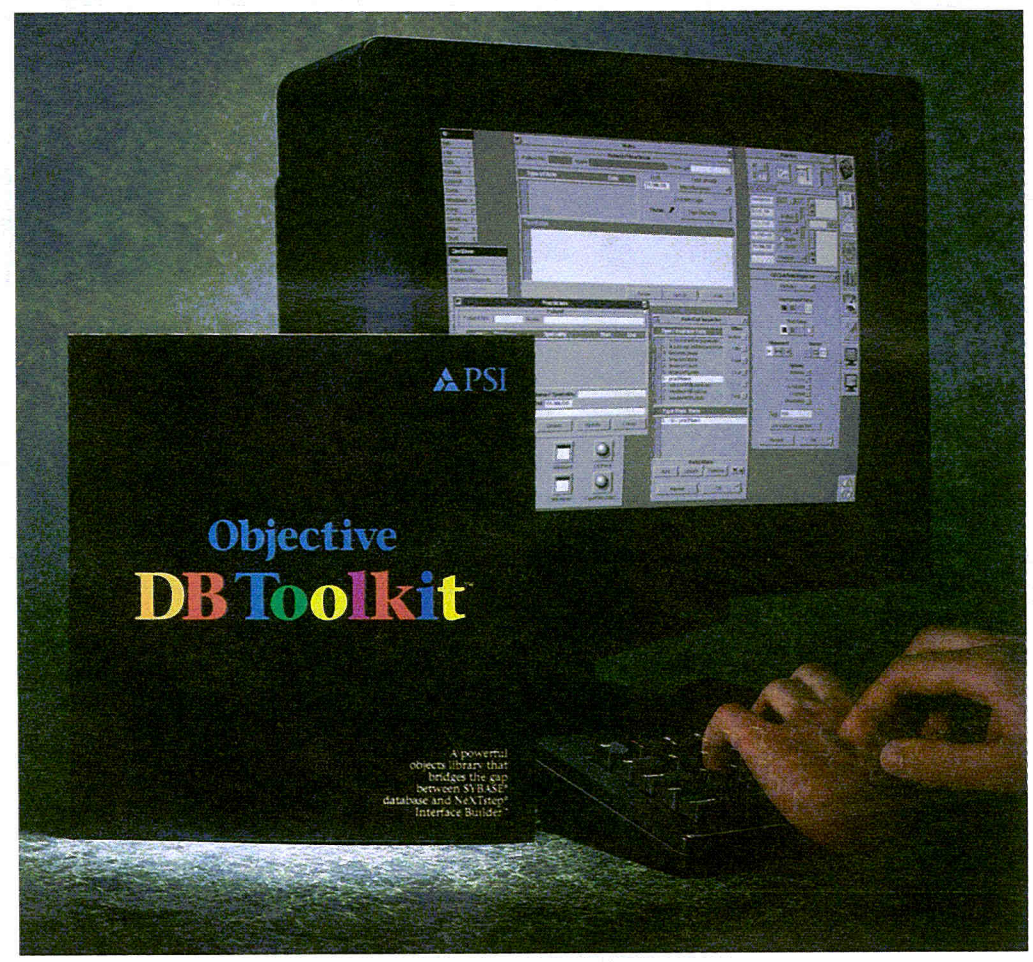
Simple Sybase access or sophisticated Sybase applications. Either one is yours with **Objective DB Toolkit**. The database interface is designed to be simple enough for untrained personnel to quickly format database queries; all you need to know is SQL. Building a simple application follows all the NeXT standards: you design the user interface from your application specifications using the Interface Builder. Then build the data structure to support it and make the connections with standard SQL statements. You'll automatically get a basic reporting capability.

DB Toolkit fields include character, integer, date, money, and float, each with templates to allow character-based input validation. Each field can be associated with two levels of help and valid choices for character fields can be displayed with a pop-up. Images and large text are handled just like any other database objects and you can even use a tape recorder to integrate sound. Multilingual applications are also a natural with DB Toolkit—as many languages as you want are supported through ASCII tables so you don't need to change any programs or windows.

Best of all the program's ease of use doesn't mean your options are limited. Any field value can be substituted in SQL statements. Internal variables can be used to communicate data from field to field or from window to window. Exits can be cascaded in a single field and you can even add some specialized exits in Objective-C. DB Toolkit is for the serious application developer who needs the power of Sybase without the pain of 3GL coding.

DB Toolkit is compatible with NeXTstep 3.0. And now it includes a new database management tool, an interface to *Improv* and intelligent form management.

Professional Software
9357 Objective DB Toolkit 2.0 ..... **$895.**



Call 1-800/800-NeXT to order.

NeXTConnection™

ADOBE

Serious graphic and *typo*graphic power. Whether you're designing business graphics, high-impact ads or flyers, technical illustrations, or even original art, get your hands on **Adobe Illustrator**.

Start from scratch or Auto Trace existing EPS or TIFF images, complete with color shades and hues. Then enhance your drawing with airbrush, contour, highlight, and fill effects. Enter and edit text directly, using various type sizes and styles and features like text wrap, kerning, and custom letterforms.

You can specify type and color (including PANTONE) with NeXT font and color panels and edit pages in "preview" or "preview selection" mode to see changes instantly. Plus NeXT services like Mail and Librarian simplify file transfers and text searches.

For even more sophisticated typographic design, **Adobe TouchType** lets you manipulate letters all sorts of ways (e.g., rotate, condense, expand), position them anywhere on the page, and has very powerful kerning features.

Ready to build up your type collection? The **Adobe Plus Pack** (22 popular Type 1 PostScript fonts) and **Adobe TypeSet Packages** both offer big savings over buying individual fonts.

Adobe Systems

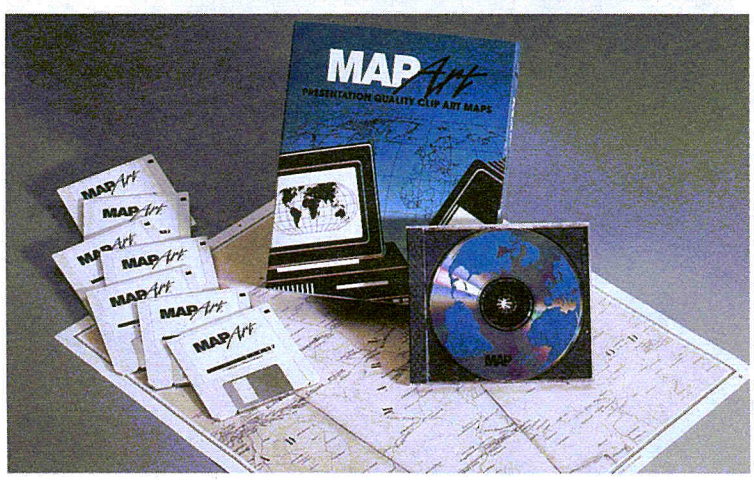
1827	Adobe Illustrator 3.0.1	$459.
9741	Adobe TouchType 2.1.1	175.
9765	Adobe Plus Pack 1.0	129.
1832	Adobe TypeSet 1	65.
1833	Adobe TypeSet 2	65.
1834	Adobe TypeSet 3	129.

TELEDIA

Three little jewels. Protect your work with **Backup Master**. Incremental backups save time and media. Compatible with any backup device (Floppy, optical, Floptical, DAT, 8mm tapes...). Restore files easily from a NeXTstep file browser. Enjoy voice control with **PhrasePlayer**. This digital dictation machine will adapt pauses between words and phrases to your typing speed, and can be controlled by your voice. Use it to type your voice mail or rehearse a speech. Need a flat-file database for multiple users with easy data entry, flexible layout design, and sophisticated queries? **FileMaster** allows immediate data entry without having to define fields. When you need a layout, you can drop in a PostScript or TIFF file as a background. Queries can use multiple files spread over a network.

Teledia

2513	Backup Master 1.1	$249.
7144	Backup Master 1.1 *(floppy only)*	79.
2514	PhrasePlayer 2.0	129.
4726	FileMaster 1.0	299.



MAPART

Maps for desktop publishing and graphic design. Imagine over 5 MB of high-quality map graphics at your fingertips! With **MapArt**, you get a comprehensive map collection that makes it easy to create attractive map graphics for brochures, newsletters, and presentations. Customize maps with Adobe Illustrator or import as background images in most NeXT applications. Maps feature country/state borders, latitude/longitude lines, and country/city names. Since each feature is a separate object, you can select areas, modify text, and add graphic symbols or text to create your own design. MapArt includes four world maps, 12 regional maps of all world continents, plus detailed maps for 24 major countries that show state/province boundaries. Now available on CD-ROM, too!

MicroMaps ... 30 day MBG

9276	MapArt 1.0	$95.
2337	MapArt 1.0 *(CD-ROM)*	95.

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FRAM

The ideal document publish groups. Imagine WYSIWYG graphics, tables, and even eq **FrameMaker**—all the writing for long, structured documer documentation, policy manua specifically designed to be us together across multiple plat compatibility between 25 diff Macintosh (and even won a

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Toll-free technical support.

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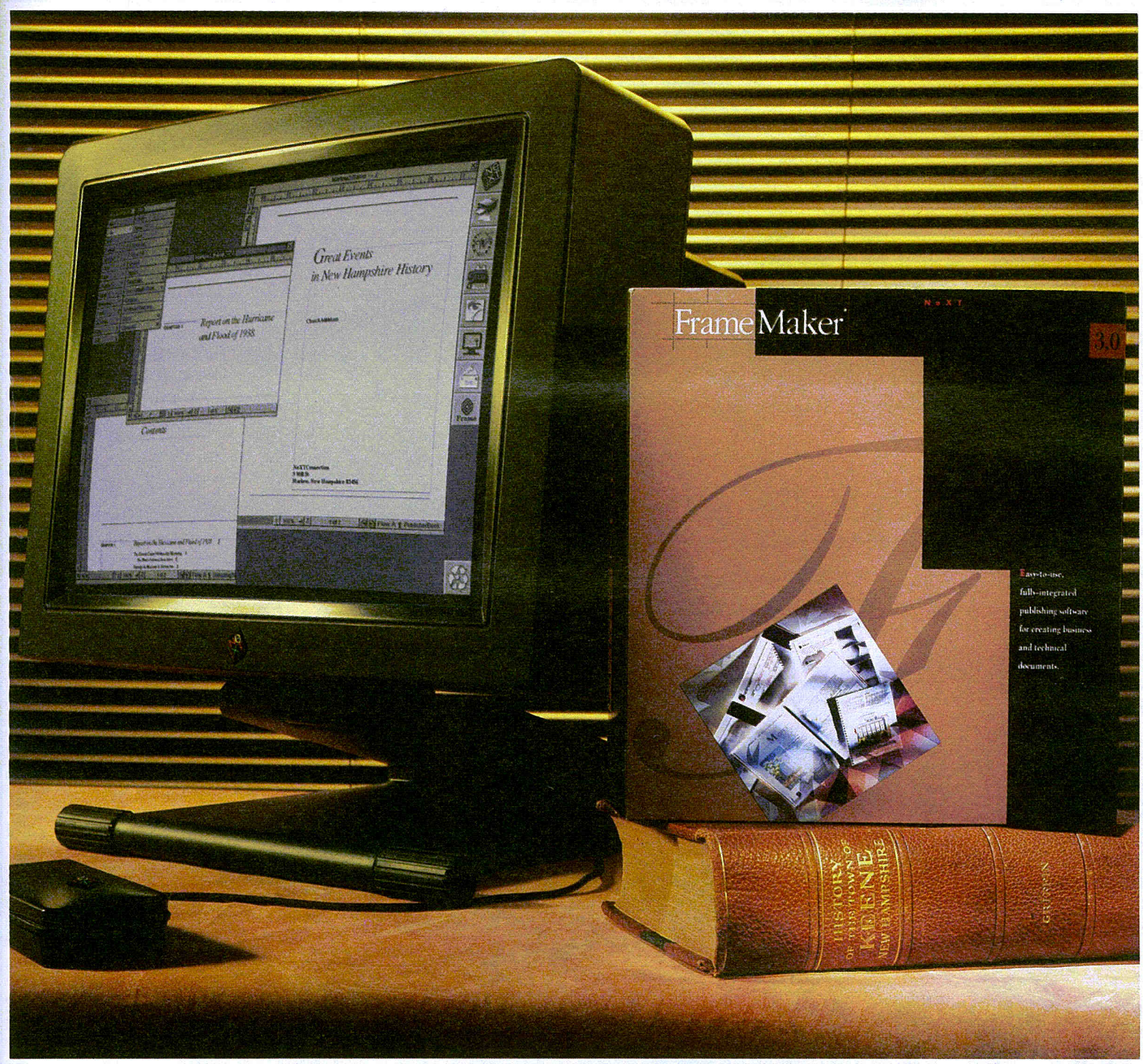

ANY DOCUMENT. NO MATTER HOW COMPLEX.

FRAMEMAKER

The ideal document publisher for corporate workgroups. Imagine WYSIWYG word processing, page layout, graphics, tables, and even equations in one program. That's **FrameMaker**—all the writing and graphic tools you need for long, structured documents like textbooks, software documentation, policy manuals, and proposals. And it was specifically designed to be used by multiple authors working together across multiple platforms. In fact it offers 100% compatibility between 25 different UNIX platforms and the Macintosh (and even won a 1991 *MacUser* Eddy Award).

The sophisticated page-layout features include the ability to create up to 25 master pages (i.e., page formats) per document. So you can ensure consistency as new files are incorporated and documents are revised, edited, and rearranged. You can also create extensive tables of contents, lists of tables, indexes, and cross references that will automatically update whenever your document changes.

FrameMaker's flexible drawing tools include a broad palette of pen and fill patterns for drawing detailed forms, diagrams, or complex schematics.

The word processing capabilities rival those of dedicated word processors. There's a 130,000-word spelling and hyphenation dictionary; search and replace; automatic page, paragraph, and footnote numbering; and a complete equation palette with over 250 symbols, delimiters, and operators.

You can also create complex multi-page tables—complete with graphics and equations that include multiple styles in a single cell. And there's an ingenious conditional text feature that lets you develop multiple variations of a document from a single source file by simply tagging the variable text or graphics.

As *NeXTWorld* (Fall '91) wrote: "If your work calls for long documents with large page counts, multiple chapters, tables, lists, illustrations, and indexes, then you won't believe your luck...FrameMaker is as good as they come."

Frame Technology
8241 FrameMaker 3.0..... **$595.**

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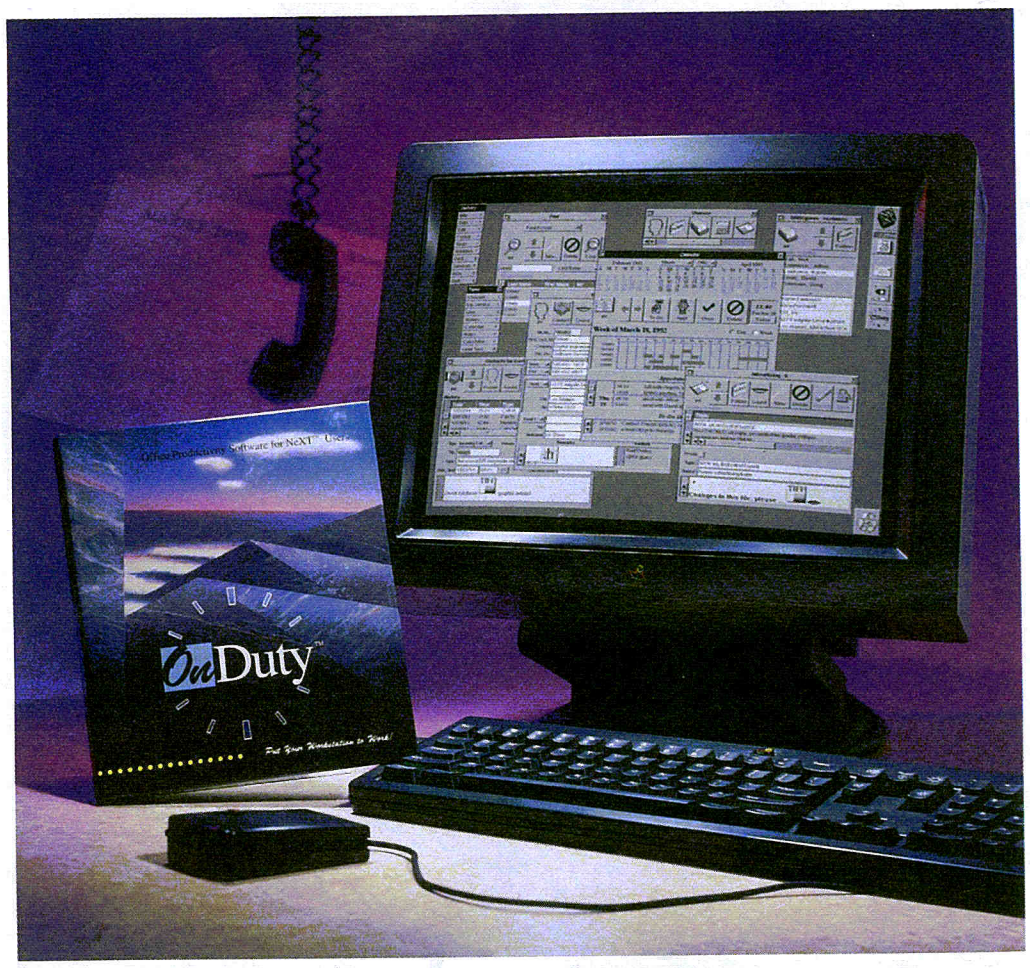
Call 1-800/800-NeXT to order.

NeXTConnection™



OnDuty

Your very own efficient, electronic executive secretary. "If you think you get too many e-mail messages and too many phone calls, this program can make all the difference in the world." That's the resounding endorsement *NeXTWorld* (Summer '92) gave **OnDuty**.

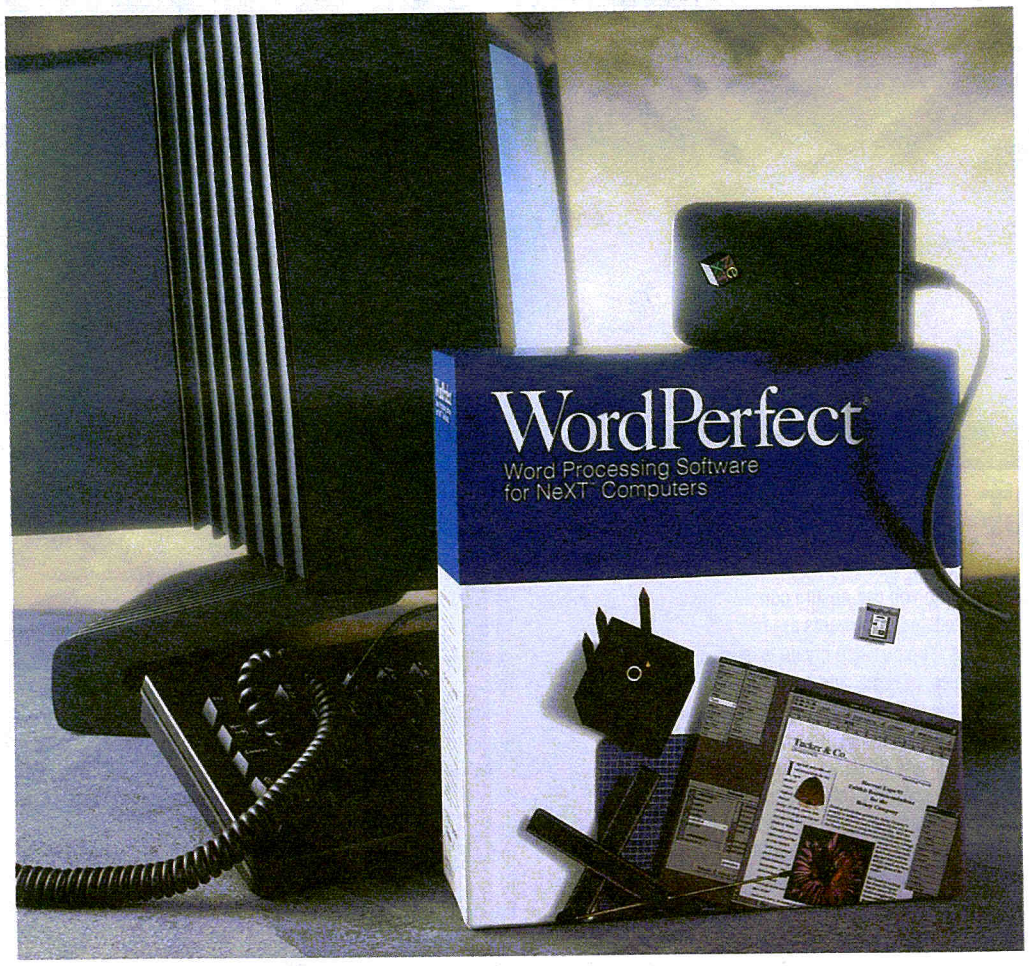
This comprehensive information manager helps you keep track of appointments, reminders, customers, clients, friends, calls, ideas, sales, and meetings. Why, with the help of OnDuty, you can finally even remember your anniversary and important birthdays.

The Calendar comes with a scheduler that shows free time slots at a glance and alarms to make sure you remember those appointments. The Contact Manager tracks calls with a built-in stopwatch, maintains an accurate contact history, and reminds you of callbacks through the Calendar. You can review either your own contacts or your whole workgroup's!

What if you can't remember that person's name? The Name Manager lets you find it by first or last name, company, zip code, city, etc. To keep things even more organized, put names into user-defined folders and then browse through them on the "Rollafile" panel.

Documents and voice notes can be linked to notes, appointments, and reminders just by dragging and dropping the document's icon. And any record can be either public or private. Plus there's a full range of reports available—including name reports in mail-merge form. OnDuty: it does everything but make the morning coffee.

Digital Instrumentation Tech. ... 1 year warranty
8657 OnDuty 1.0 ..... **$279.**



WordPerfect

WordPerfect unleashed! Full-time WYSIWYG and effortless multitasking. There are a whole lot of DOS users of **WordPerfect** out there who are struggling with whether they should start using their favorite application under Windows or on the Mac. Well, the answer is neither. If you want to realize WordPerfect's full word-processing potential, the solution is NeXT.

NeXT's unified PostScript imaging system puts the infamous WordPerfect Preview mode to rest once and for all. Every element, including fonts of all sizes, headers, footer, footnotes, graphics, and columns, always appear just as they will print. And NeXT features like built-in multitasking and fax capability make WordPerfect the ultimate power tool for working with words.

But, of course, not *just* words. WordPerfect easily integrates text and graphics. Just grab your image file with the mouse and drop it on the page wherever you want (inserted in a line of text, tied to a paragraph, or even placed in a header or footer). You can scale, move, and rotate your images every which way, and add captions and borders with ease. Each time the type will automatically rearrange itself.

Naturally, you get all the basic word-processing power features WordPerfect is famous for: parallel and newspaper columns, powerful macros, mail merge, table of contents, indexing, footnotes/endnotes, a 115,000-word spell checker, thesaurus, and automatic timed backup. Any Questions? Ask the Digital Librarian or consult the online reference manual. This is truly full-featured word processing for NeXT.

WordPerfect
8818 WordPerfect 1.0.1 ..... **$299.**

Get professional drawin
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No foam peanuts. We use 100% recycled paper to pack.

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NeXTConnection™

DRAW ON EXPERIENCE.

VIRTUOSO

Get professional drawing results with tools from the drawing professionals with the advanced PostScript drawing design and production program, Virtuoso. As the developer of award-winning graphics programs such as *Fontographer* and *Aldus FreeHand*, Altsys knows what you need most from a drawing program—speed, ease of use, and an advanced feature set so you can get the job done quickly, easily, and professionally. Altsys has taken their knowledge and experience and combined it with the power of the NeXT to bring you Virtuoso.

You can create artwork free-style with the Freehand drawing tool or import it from the extensive, professional clip-art library. Draw basic shapes and lines with the rectangle, oval, and straight line tool, or get fancy with the Multigon and Pen tools. Rotate, reflect, scale, and skew objects quickly and easily. Autotrace scanned images with superb control.

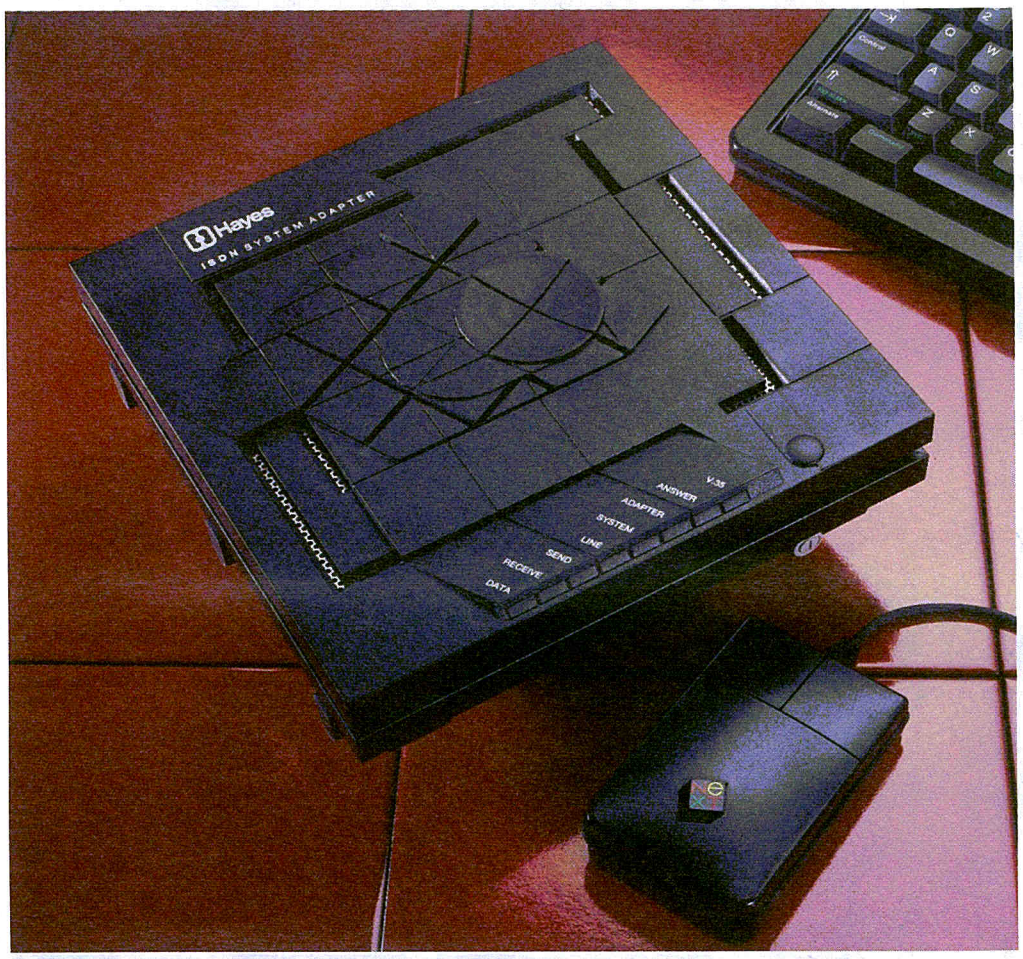
Virtuoso also gives you the editing, coloring, and organization tools you need to create your designs. Undo or redo—not just the last few actions, but up to 100 levels. Zoom in or out—not just 100% or 200%, but up to 1600%. Choose spot process colors from the NeXT Color Panel then drag and drop them into objects. Automatically create percentages of any color with the Tint Panel. Maintain your work in an unlimited number of nameable, reorderable layers—each one separately hideable and lockable.

Wonderfully flexible PostScript support, meticulously accurate alignment control, superb text editing and typographic control, varied import and export capabilities, comprehensive built-in production tools (including color separations, spot-to-process conversions, and on-screen previews)— all this is just the beginning of the list of innovative and productive features in Virtuoso, each designed to simplify your work and stimulate your creativity.

Altsys
6931 Virtuoso 1.0..... **$495.**
8683 Virtuoso 1.0 *(5 pack)*..... **1695.**

Call 1-800/800-NeXT to order.

NeXTConnection™



ISDN System Adapter

Connect to the new standard of voice and data capabilities. It's called ISDN—Integrated Services Digital Network, a standard digital telecommunications technology for integrated voice and high-speed data transmission. And with software developed to support it, you'll be able to handle all your voice and data communications from your NeXT computer with exciting new capabilities like multiple sessions over one line and improved voice communications.

Hayes ISDN System Adapter is an external RS-232 serial port device that provides compatibility with AT&T and Northern Telecom ISDN switches and will support future switch updates including the National ISDN standards. The ISDN System Adapter comes complete with its own Digital Signal Processor (DSP), codec, high-speed processor, and power supply. It's all the hardware you need to bring ISDN to any platform and an analog phone. It fully implements Hayes' Standard AT Command Set for ISDN (which means you can access its power through familiar Hayes-compatible software) and Hayes AutoStream (which, with supported software, opens the door to multiple voice/data sessions).

Data transmission from 300 bps to 38,400 bps is supported, and voice capabilities include a standard analog phone interface along with battery feed and ring voltage for up to three typical analog devices (e.g., phone, fax, and answering machine).

This is truly the new age of telecommunications and, as you would expect, Hayes is there on the front lines with NeXT.

Hayes ... 2 year warranty

4998 ISDN System Adapter *(requires cable)*..... **$1199.**

Metaresearch

High-quality video and sound for every NeXT. Now you can put the power of your DSP port to full use. **Color Digital Eye** grabs video from a camcorder, VCR, or other video source. Still pictures have a resolution of up to 640 x 480 at 24 bits of color and you can grab animation at 160 x 120/15 frames per second. And it comes bundled with *ColorSnapshot* and *ColorMovieWorks*.

Digital Ears and **SoundWorks** give you incredible control over sound on your NeXT. Digital Ears is used to input CD-quality sound, while SoundWorks lets you edit, create and apply your own effects, and mix sounds.

Metaresearch ... 1 year warranty

9682 Digital Ears ..... **$499.**
9683 Digital Ears *(with SoundWorks)* ..... **669.**
4848 Color Digital Eye ..... **995.**
9680 SoundWorks 2.0..... **269.**

Peripheral Land

It's always drive time at PLI. PLI's **SuperFloppy 2.88 Drive** can handle any format 3.5" diskette. You can read, write, and format all NeXT and DOS densities and third-party software is available that provides the same support for Mac formats. The **PLI CD-ROM Drive** features the latest Sony engine for extraordinarily fast access time. It's compatible with any NeXT machine running Mach Release 2.0—no special drivers are needed. Get speed and infinite capacity with the **Infinity Optical 3.5" Drive**. New magneto-optical technology provides 35 ms average access time and full rewritability on a removable, crash-proof 105 MB formatted cartridge. So however you want to save, backup, or transport data, PLI has the answer.

Peripheral Land, Inc. ... 1 year warranty

8547 SuperFloppy 2.88 Drive ..... **$449.**
8899 PLI CD-ROM Drive ..... **749.**
7143 Infinity Optical 3.5" 128 MB Drive..... **1695.**
4847 Infinity 88 Turbo..... **879.**

RightB

And now the moment you
real live, gen-u-ine, true b
layout program for NeXT:
wrote: "For desktop publ
between the easy-to-use
and the precise typograph
[PasteUp] offers the best
You see, while other pa
the limits of their platform
NeXT's unique combinati
Display PostScript, UNIX,
deliver optimum versatilit

Call us anytime from 8:00 a.m. Monday thru midnight Friday.

SIMSON00001248

SIMSON00001249

NeXTConnection™

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voice and data capabilities.
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..... **1695.**
..... **879.**

READY TO DESKTOP PUBLISH ON NeXT?

RightBrain Software

And now the moment you've all been waiting for. The first real live, gen-u-ine, true blue (well...cyan probably) page-layout program for NeXT: **PasteUp**. As *NeXTWorld* (Fall '92) wrote: "For desktop publishers who have faced a choice between the easy-to-use pasteboard approach of *PageMaker* and the precise typographical control of *QuarkXPress*, [PasteUp] offers the best of both worlds."

You see, while other page-layout programs are pushing the limits of their platforms, PasteUp takes advantage of NeXT's unique combination of object-oriented programming, Display PostScript, UNIX, and high-speed networking to deliver optimum versatility, productivity, and speed.

This is one desktop publisher that's easy even for newcomers because it handles words like a word processor and graphics like a draw program. Everything—words, graphics, colors, styles—can be edited directly on the page. And they can all be easily moved and manipulated by dragging and dropping. Plus the Page Navigator provides a thumbnail view that makes it easy to move around your document making changes.

Other innovative features include unlimited multiple undos (yes, you can return to that step you took fifteen minutes ago), Master Elements that can be edited anywhere with the changes reflected throughout, automatic drop shadows, smart quotes (the kind that hang correctly), and a unique Dimensions panel that lets you size elements either visually or by entering precise values.

Professional designers also get all the fine points (and picas) of typography and color: full rotation and shearing of text, precision kerning and tracking with adjustments to 1/1000 of an em, and Pantone support.

PasteUp—it's the page-layout software you've been waiting for—whether you're a NeXT owner waiting to take the plunge into desktop publishing or a desktop publisher waiting to take the plunge into NeXT.

RightBrain Software ... 30 day MBG
6809 PasteUp ..... **$595.**

Call 1-800/800-NeXT to order.

ElectroFile

Electronic filing arrives. Introducing a real solution for document management that gives you the power to locate any type of file—text, TIFF, EPS, etc.—quickly and easily. No matter how many files your library contains.

ElectroFile from Insight Software allows you to build your own classification scheme, based upon your own requirements. Because documents can be indexed and classified in numerous ways, they become much easier to locate—even those without text. ElectroFile's retrieval engine is based upon B*Tree indexes which generate fast searches, regardless of the number of documents in the library. You can design complex search paradigms with just a few keystrokes, thereby reducing thousands of possibilities down to the right one. Once you find the file you're looking for, just click "show" and ElectroFile will display an image of the original document alongside the classification interface. Then you can make corrections, attach other files, add notes or important text, and even record voice messages on the document.

And now ElectroFile is compatible with a variety of high-speed scanners and optical character recognition (OCR) systems. So you really can use it as a paperless filing cabinet. Just scan images and documents directly onto your hard drive via ElectroFile and forget about hard copies altogether!

Designed to be both powerful and flexible, ElectroFile is ideal for imaging, cataloging, customer support, account processing, or any activity which can take advantage of cross-indexing. After all, if you own a NeXT computer you're already halfway to having the world's most sophisticated filing system right there on your desk—now, with ElectroFile, you can go all the way.

Insight Software ... 60 day MBG

3308 ElectroFile 2.0 ..... **$449.**

DoveFax Desktop

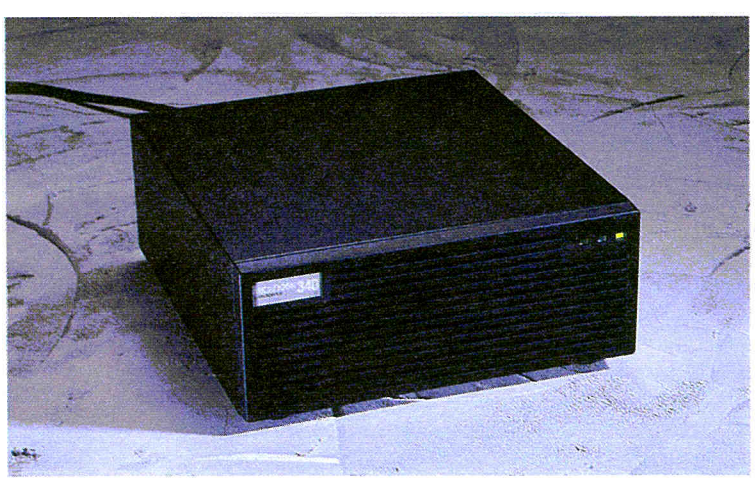
A fax and modem combined. The **DoveFax Desktop for NeXT** features a 9600 bps CCITT Group-3-compatible fax that makes full use of the intuitive NeXT fax interface so you can send any kind of document directly from your NeXT. DoveFax features true background operation, an on line telephone directory, automatic answering, fax preview, and customized cover pages. You can send faxes at high resolution and print incoming faxes at your choice of 200 x 200 dpi or 200 x 100 dpi Display PostScript.

DoveFax Desktop also includes a Hayes-compatible 2400 bps modem that supports a complete range of communications services, protocols, applications, and electronic bulletin boards. The **DoveFax 14.4 Pro** handles everything the DoveFax can, but has a 14,400 bps data modem with V.32, V.42/V.42bis advanced data compression and error correction for throughput up to 57,600 bps. You can also send faxes at 14,400 bps (downward compatible to 9600 bps). Both modems are backed by Dove's solid customer support and 1-year warranty.

Dove Computer ... 1 year warranty

9356 DoveFax Desktop ..... **$279.**

7154 DoveFax 14.4 Pro ..... **$549.**



Micropolis

How much data can a hard drive hold? If it's a Micropolis **MICRODISK**, up to 1.1 *gigabytes*. And that's *formatted* on the NeXT. These super-capacity, high-performance, external disk drives can swallow multimedia and other huge files in a single gulp. They feature effective access times as low as 3.9 ms and data transfer rates as high as 10 MB/second. In fact, in a *BYTE* (11/90) lab test of high-capacity drives, a MICRODISK won first place overall for its "exemplary sequential write numbers and killer results on the tree copy test." Each one is 100% Novell compatible, NetWare Ready, and comes with a five-year drive warranty, sturdy power supply, 50-pin SCSI cable, external SCSI terminator, and a silent, high-flow cooling fan.

Micropolis ... 5 year warranty

8984 280 MB MICRODISK *(formatted)* ..... **$1589.**
4415 550 MB MICRODISK *(formatted)* ..... **1889.**
4412 860 MB MICRODISK *(formatted)* ..... **2395.**
6808 1.1 GB MICRODISK *(formatted)* ..... **2595.**

Canon I

Flatbed scanning at 300

just the beginning of the a
you get with the new gray
Canon. Its convenient flat
text, graphs, drawings, m
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optional document feeder
pages automatically. Plus
makes this one scanner tl

Bundled with the IX-30
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No hidden charges.

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NeXTConnection™

FILE

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copies altogether!
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..... **$449.**

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..... **$1589.**
..... **1889.**
..... **2395.**
..... **2595.**

GIVE YOUR OFFICE A BETTER SCAN.

CANON IMAGE SCANNER

Flatbed scanning at 300 dpi, 256 shades of gray. That's just the beginning of the advanced image-handling technology you get with the new gray-scale **Image Scanner IX-30F** from Canon. Its convenient flatbed design accomodates books, text, graphs, drawings, maps, and pictures. The typical page can be scanned in about ten seconds. And there's even an optional document feeder available that will scan up to 20 pages automatically. Plus its small 13.5" x 18.5" footprint makes this one scanner that won't monopolize your desktop.

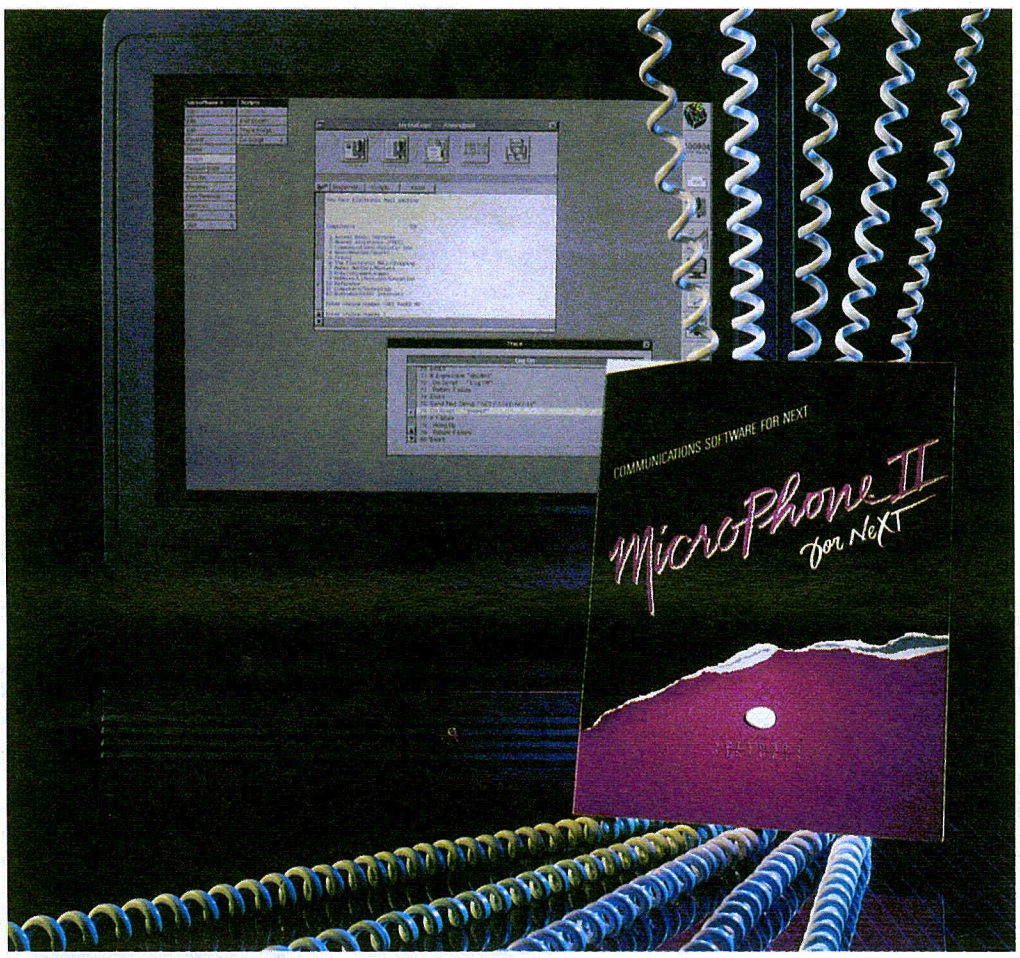
Bundled with the IX-30F is Canon's **IX-SCANS** software which can emulate from 50 dpi up to as high as 400 dpi with magnification, which enables the Scanner to reproduce photos and other continuous-tone images with great accuracy. You can modify images by enlarging or reducing, and adjusting contrast and brightness. You can also create the special looks you need with functions like image reversal, mirror image, windowing, and downloaded dither patterns.

For further refinements, simply capture your scanned image as a TIFF or EPS file and import it into other applications. Setup is simple—it's a straightforward SCSI connection. For those who aren't yet into the NeXT level of computing there are also optional interfaces available for connecting to both Macs and PCs.

Whatever your scanning needs—desktop publishing, research, documentation, presentations, etc.—the Canon Image Scanner IX-30F along with Canon IX-SCANS software gives you the combination of speed, resolution, and convenience you need to make it a productive part of your office environment from the day you plug it in.

Canon ... 1 year warranty
3269 Image Scanner IX-30F & IX-SCANS Bundle .. **$849.**

Call 1-800/800-NeXT to order.



MicroPhone II

Great communications software has arrived. With **MicroPhone II**, you'll have easy, intuitive communications software that takes full advantage of NeXT capabilities.

Watch in amazement or, better yet, do something else entirely, while MicroPhone II dials your mail service and automatically downloads your messages in the background.

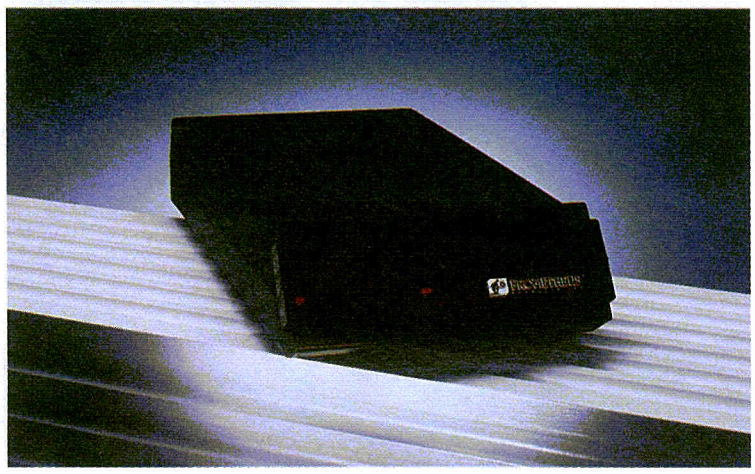
Next time you log onto your favorite service, turn on the *Watch Me* feature and your keystrokes will be saved. Give the resulting script a button and you're never more than a click away. If you've written MicroPhone scripts in Windows or on the Mac, you'll discover you can use them on the NeXT with little or no modification.

And wait until you see Loran, a new MicroPhone II document that includes front ends to CompuServe Mail and Software Ventures' own BBS. Even though you send and receive mail from entirely different systems, the Loran interface you use is the same, saving you time and effort. Eventually, Loran will hold additional front ends for news, messaging and other services, making it a true information valet. You can also build your own NeXT front end with MicroPhone II's enhanced scripting power and NeXT's Interface Builder.

It's so easy to be online with MicroPhone II that you'll soon be doubling your pleasure and your productivity—thanks to multi-session capability that allows you to log onto several information services simultaneously. Safely send or receive anything—text, pictures, or sound—through a comprehensive set of file transfer protocols such as ASCII, XMODEM, YMODEM, and ZMODEM.

Insanely great software for an insanely great computer.

Software Ventures ... 30 day MBG
4759 MicroPhone II 1.0 ..... **$295.**



Prometheus ProModems

The Ultima(te) in fax modems. Sending large files and faxes can tie up the phone lines and transform your phone bill into a budget breaker. The solution is high-speed transmission. Well, you won't find a faster data/fax modem for your NeXT than the **ProModem Ultima**. It's a 14,400 bps data modem combined with a 9600 bps send/receive fax modem. Fully Hayes-compatible, the modem features true V.32bis compliance for raw speed connections of 14,400 bps and up to 57,600 bps with V.42bis/MNP 5 data compression and error correction!

The Ultima supports the Class II standard for fax modems, ensuring compatibility with the built-in fax software in the NeXTstep operating system. ProModem Ultima is backed by a two-year warranty.

Prometheus ... 2 year warranty
2197 ProModem Ultima *(includes 14.4 Modem)* ..... **$599.**

Toshiba Disks

Toshiba, the NeXT choice in 2.88 MB ED Floppy Disks. NeXT chose Toshiba 2.88 MB floppy disks to include with each NeXT system for very good reasons. Toshiba invented and patented the new technology behind 2.88 MB disks and has 14 years of experience with 2.88 MB disk technology. Over that time, Toshiba developed a new recording medium—*barium ferrite*—and a new recording technology—*perpendicular recording*—to bring you twice the storage capacity of a conventional HD diskette with greater data security and twice the transfer rate. Toshiba 2.88 MB floppy disks are made in the USA using a new standard of manufacturing expertise that's well beyond those used today for conventional diskettes. So while other diskette makers are just learning about 2.88 MB ED disks, Toshiba delivers 14 years of experience in every one of their 2.88 MB ED floppies.

Toshiba ... lifetime warranty
4858 Toshiba 3.5" ED Floppy Disk *(5 Pack)* ..... **$29.**
9755 Toshiba 3.5" ED Floppy Disks *(10 Pack)* ..... **55.**

Overnight shipping $3.

MDS Re

A removable drive at a rea
for anyone who needs to ar
of data—in other words, a
large spreadsheet, graphics
files that today's sophistica

The **MDS 88 Removable**
mechanism. It has a 20ms
use as your everyday drive
60,000-hour MTBF (mean

Other features include a
you can change the SCSI ID
power outlets (to power th
a single switch), and both
status lights.

The MDS 88 is also easy
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So if you're ready for lim
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NeXTConnection's toll-free

MDS Drives ... 2 year wa
6804 MDS 88 Removable
3603 MDS 88 Removable
3600 MDS 88 Removable

Don't worry, optical disk
512 MB Optical Cartridges
reading and writing multi-

And why not? Optical ca
NeXTstep Extended Edition
mighty handy any time you
And since you can write to
transporting huge amounts

These reliable Canon Op
Cube and have 256 MB of

Canon ... 90 day warrant
9811 512 MB Optical Cart

Running out of RAM? We
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Memory ... 2 year warra
8910 4 MB SIMM *(80ns)*.
1935 8 MB Memory Upgra
Turbo; two 4 MB x 8
8911 16 MB Memory Upg

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NE II

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..... **$599.**

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lium—*barium ferrite*—and a
twice the storage capacity
ne transfer rate. Toshiba
manufacturing expertise
vhile other diskette makers
of experience in every one

..... **$29.**
..... **55.**

MDS Removable Drive

A removable drive at a remarkable price. Here's the answer for anyone who needs to archive or transport multiple megabytes of data—in other words, anyone trying to deal with those rather large spreadsheet, graphics, multimedia, and other business files that today's sophisticated applications are generating.

The **MDS 88 Removable Drive** features the reliable SyQuest mechanism. It has a 20ms average seek time—fast enough to use as your everyday drive as well as for backup—and a 60,000-hour MTBF (mean time between failure) rate.

Other features include a push-button SCSI ID selector (so you can change the SCSI ID without special tools), two switched power outlets (to power the drive and two other devices from a single switch), and both read/write and cartridge-in-use status lights.

The MDS 88 is also easy to daisy chain because it has dual 50-in SCSI connectors and an external terminator (which can be changed without disassembling the unit).

So if you're ready for limitless storage, the MDS 88 is a great solution. It comes complete with an 88 MB cartridge and SCSI 2 cable and is backed by a solid 2-year warranty and NeXTConnection's toll-free technical support.

MDS Drives ... 2 year warranty

6804	MDS 88 Removable Drive	$599.
3603	MDS 88 Removable Cartridge	107.
3600	MDS 88 Removable Cartridge *(10 pack)*	999.

Canon Optical Disks

Don't worry, optical disk users: we haven't forgotten your memory! We continue to stock **512 MB Optical Cartridges** at very competitive prices for all those NeXT pioneers still happily reading and writing multi-megabytes of information to the Cube's optical disk.

And why not? Optical cartridges have so much room on them they can hold the entire NeXTstep Extended Edition complete with Shakespeare and the dictionary. This can come in mighty handy any time you have a hard-drive problem and need to find another way to boot up. And since you can write to optical cartridges, there's nothing like them for backing up and transporting huge amounts of data.

These reliable Canon Optical Cartridges are designed specifically for the 68030 and 68040 Cube and have 256 MB of storage space on each side for a total of 512 MB per disk.

Canon ... 90 day warranty

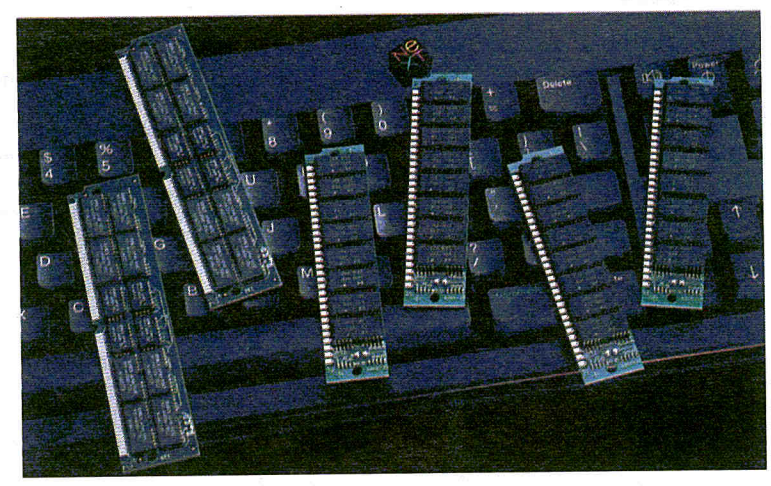
9811	512 MB Optical Cartridge MO-502m	$175.

Memory Upgrades

Running out of RAM? We can help you get back to full power overnight. Just call as soon as you start running out of room and we'll send more memory by Airborne Express for delivery the next business day. Our **4 MB** and **16 MB Memory Upgrade Kits** feature low profile, non-parity, 80ns SIMMs that are compatible with the 68030 and 68040 Cube and the 040 workstation (monochrome only). We also carry **8 MB Memory Upgrade Kits** for NeXTstation Color and NeXTdimension boards. (The latter requires 2 Kits/16 MB at a time.) And Installation? For the workstation we recommend an authorized dealer—otherwise you risk voiding the warranty. But you can go ahead and install them yourself in the cube—we'll provide toll-free tech support.

Memory ... 2 year warranty

8910	4 MB SIMM *(80ns)*	$125.
1935	8 MB Memory Upgrade Kit *(for NeXTstation Color, NeXTdimension, and NeXTstation Turbo; two 4 MB x 8 SIMMs, 70ns)*	339.
8911	16 MB Memory Upgrade Kit *(four 4 MB x 8 SIMMs, 80ns)*	479.



NeXTConnection™

Corporate Accounts Welcome

Yes, we gladly accept P.O.s. Always have, always will. In fact, we do everything possible to make corporate mail-order purchasing of computer software and peripherals as easy and enjoyable a process as possible—within the realm of common decency, of course. Many companies (including most of the Fortune 1000 and other just-as-fortunate smaller ones) have accounts with us. If you'd like to open one (or check whether your company already has one), simply call our order line at 800-800-NeXT.

PRODUCT INDEX

GENERAL BUSINESS & PRODUCTIVITY

Adamation ... 30 day MBG
(See pages H & I)
3357 Who's Calling? 2.5 ... $295.
6817 What's Happening? ... 219.
3334 LiveWire *(4 pack)* ... 599.

Appsoft ... 60 day MBG
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4128 WriteNow 2.1 ... 159.
4997 WriteNow 2.1 *(5 pack)* ... 739.

Athena Design ... 30 day MBG
8684 Mesa AR-1 ... 395.

DIT ... 1 year warranty
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Imagine Multimedia, Inc.
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1396 MediaStation 2.1 ... 495.
1397 MediaStation 2.1 *(5 pack)* ... 2199.
1398 MediaStation 2.1 *(20 pack)* ... 5499.
1400 MediaStation *(Educational)* ... 295.

Information Technology ... 60 day MBG
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3711 SpeedDex 1.0 *(10 pack)* ... 699.

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Insight Software ... 30 day MBG
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Lighthouse Design, Ltd. ... 60 day MBG
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1792 Improv/SoftPC Special ... 729.

Teledia
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4726 FileMaster 1.0 ... 299.

WordPerfect
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8818 WordPerfect 1.0.1 ... 299.

COMMUNICATIONS & DATA TRANSFER

DataViz ... 60 day MBG
1823 MacLinkPlus/PC 6.0 ... 129.

DIT ... 1 year warranty
8656 FloppyWorks 2.2L ... 69.

Dove Computer ... 1 year warranty
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7154 DoveFax 14.4 Pro ... 549.

Hayes ... 2 year warranty
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2307 Smartmodem 2400 *(requires cable)* ... $279.
7391 Ultra 9600 Modem *(requires cable)* ... 599.
5024 Ultra 14.4 Modem *(requires cable)* ... 669.
4998 ISDN System Adapter *(reqs. cable)* ... 1199.

Insignia Solutions
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1456 SoftPC 2.05 ... call

Intel ... 5 year warranty
6415 V2400 Modem *(requires cable)* ... 155.
3864 14.4EX Modem *(requires cable)* ... 469.

Marble Associates
1012 Teleconnect ... 249.

Prometheus ... 2 year warranty
(See page R)
2197 ProModem Ultima *(includes 14.4 Modem)* 599.

Software Ventures ... 30 day MBG
(See page R)
4759 MicroPhone II 1.0 ... 295.

Telebit ... 1 year warranty
8907 T2500 Modem *(requires cable)* ... 669.
5080 T3000 Modem *(requires cable)* ... 669.
8165 Worldblazer Modem *(requires cable)* ... 769.

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9765 Adobe Plus Pack 1.0 ... 129.
9741 Adobe TouchType 2.1.1 ... 175.
1832 Adobe TypeSet 1 ... 65.
1833 Adobe TypeSet 2 ... 65.
1834 Adobe TypeSet 3 ... 129.
Adobe Fonts Available ... call

Altsys
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6931 Virtuoso 1.0 ... 495.
8683 Virtuoso 1.0 *(5 pack)* ... 1695.

Appsoft ... 60 day MBG
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4465 Draw 1.02 ... 299.
7028 Draw 1.02 *(5 pack)* ... 1295.
8685 Image ... 749.

Frame Technology
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8241 FrameMaker 3.0 ... 595.

Lighthouse Design, Ltd. ... 60 day MBG
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8621 Diagram! 1.1 ... *special* 239.
8686 Diagram! 2.0 *(requires NeXTstep 3.0)* ... 395.

MicroMaps ... 30 day MBG
(See page J)
9276 MapArt 1.0 ... 95.
2337 MapArt 1.0 *(CD-ROM)* ... 95.

Rightbrain Software ... 30 day MBG
(See page 0)
6809 PasteUp ... 595.

Vivid Publishing ... 30 day MBG
4496 TypeView 1.0 ... 99.

RECREATIONAL

Athena Design ... 30 day MBG
9457 Culture Shock 1.0 *(color)* ... $25.

David S. Joerg Prod. ... 30 day MBG
4846 Ragnarok ... 39.

Lighthouse Design, Ltd. ... 60 day MBG
3315 Void 2.0 *(3 user license)* ... 99.

VIDEO & SOUND

Metaresearch ... 1 year warranty
(See page N)
9682 Digital Ears 499. 9683 *(w/SoundWorks)* 669.
9681 Digital Eye *(monochrome)* ... 829.
4848 Color Digital Eye ... 995.
9680 SoundWorks 2.0 ... 269.

Midiapolis ... 30 day MBG
7141 SoundHouse ... 59.
5972 SoundBursts *(effects)* ... 79.
6025 SoundBursts *(percussion)* ... 79.

UTILITIES

Agog, Inc. ... 30 day MBG
1476 Squash! 1.0 ... 79. 1478 *(10 pak)* ... 699.

CuillaMartin ... 30 day MBG
6225 Calculator Set *(single)* ... 59.
6226 Calculator Set *(10 pak)* ... 479.

MetroSoft Inc.
8325 MetroTools 1.0 ... 99.

Rightbrain Software ... 30 day MBG
4148 LockScreen 3.2, 4493 LaunchPad, 4498 Portfolio or 4494 Rulers ... *ea.* 79.
3728 Bundle *(All four listed above)* ... 199.

Skylee Press
8663 Big Green Disk *(optical disk only)* ... 299.
8716 Big Green CD *(requires NeXTstep 3.0)* ... 79.

Teledia
(See page J)
2514 Phrase Player 2.0 ... 129.
2513 Backup Master 1.1 ... 249.
7144 Backup Master 1.1 *(floppy only)* ... 79.

PROGRAMMING & MATH TOOLS

Absoft
8898 Fortran 77 3.1 ... 839.

Objective Technologies
(See page H)
9347 [OT Palettes: 2.0] Chooser ... 429.
9346 [OT Palettes: 2.0] Math ... 650.
9345 [OT Palettes: 2.0] SmartField ... 650.
9344 [OT Palettes: 2.0] Graph ... 1259.
3282 OT Provide 1.0 ... 699.
7142 SqlBuddy *(floating license)* ... 399.

ONyX Systems ... 30 day MBG
2340 BugByte 2.1 ... 239.

Professional Software
(See page I)
9357 Objective DB Toolkit 2.0 ... 895.

Triakis ... 30 day
1963 T-Calc 1.0 ...
1965 Math++ 3.0 ...
1966 DAN, the Data AN

White Pine Softw
(See page F)
6316 eXodus 1.0 ...

Wolfram Researc
2516 Mathematica 2.0 .

INPUT

American Power
7105 Smart-UPS 600...
9365 Smart-UPS 900...
9364 Smart-UPS 1250.
9366 Smart-UPS 2000.
7107 Back-UPS 450 ....

Canon ... 1 year
(See page Q)
3269 Image Scanner IX-

CH Products ...
6814 TrackBall ...

Second Glance S
5973 Scantastic *(Epso*
7156 Scantastic *(HP S*

Tripp Lite ... 2 ye
1528 600VA On-Line U

DRIVES

All drives rec

Cables ... lifetim
8908 SCSI 1-50 Pin Ce
8906 SCSI 2-50 Pin Ce
8909 50 Pin-50 Pin Ce
1106 SCSI Terminator
8992 68030 Modem Ca
8991 68040 Modem Ca
1540 Mini DIN 8 to Min
1441 Mini DIN 8 to DB
3466 BNC Connector
3458 BNC T-Connecto

- We accept VISA & M
- No surcharge will be
- Your card is not charg
- If we must ship a part that complete the ord
- No sales tax is charg
- All U.S. shipments in First Class Mail.
- International orders U
- Manufacturer support
- Upon receipt and app day for immediate sh
- Corporate P.O.s are
- C.O.D. maximum is $
- 120-day limited warra
- Defective software re replaced at our discr promotions are subje
- Order lines: Open cor Business offices: Call

Call 1-800/800-NeXT to order.

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NeXTConnection™

Triakis ... 30 day MBG
1963 T-Calc 1.0 ... $59.
1965 Math++ 3.0 ... 199.
1966 DAN, the Data ANalyzer 2.0 ... 269.
White Pine Software
(See page F)
6316 eXodus 1.0 ... 239.
Wolfram Research ... 30 day MBG
2516 Mathematica 2.0 ... 1699.

INPUT/OUTPUT

American Power ... 2 year warranty
7105 Smart-UPS 600 ... 439.
9365 Smart-UPS 900 ... 649.
9364 Smart-UPS 1250 ... 869.
9366 Smart-UPS 2000 ... 1339.
7107 Back-UPS 450 ... 215.
Canon ... 1 year warranty
(See page Q)
3269 Image Scanner IX-30F & IX-SCANS Bundle 849.
CH Products ... 30 day MBG
6814 TrackBall ... 119.
Second Glance Software
5973 Scantastic *(Epson ES300C)* ... 299.
7156 Scantastic *(HP ScanJet IIc)* ... 299.
Tripp Lite ... 2 year warranty
1528 600VA On-Line UPS ... 559.

DRIVES & CABLES

All drives require a SCSI cable.

Cables ... lifetime warranty
8908 SCSI 1-50 Pin Centronics ... 12.
8906 SCSI 2-50 Pin Centronics *(4 ft.)* ... 45.
8909 50 Pin-50 Pin Centronics ... 15.
1106 SCSI Terminator ... 29.
8992 68030 Modem Cable *(8 ft.)* ... 15.
8991 68040 Modem Cable *(8 ft.)* ... 15.
1540 Mini DIN 8 to Mini DIN 8 Null Modem Cable 15.
1441 Mini DIN 8 to DB25 Null Modem Cable ... 15.
3466 BNC Connector *(50 ohm)* ... 3.99
3458 BNC T-Connector ... 8.99
3465 BNC Terminator without Ground ... $5.99
5722 BNC Terminator with Ground ... 6.
3456 25' Ethernet Cable *(w/BNC Connectors)* ... 25.
3432 50' Ethernet Cable *(w/BNC Connectors)* ... 39.
3437 100' Ethernet Cable *(w/BNC Connectors)* ... 59.
IOMEGA ... 1 year warranty
(See page A)
2530 Bernoulli 90 MB Cartridge ... 149.
2467 Bernoulli 90 MB Cartridge Tri-Pack ... 439.
6499 Bernoulli Transportable 90 PRO ... 679.
7151 NeXT Interface Kit ... 65.
2481 Care Kit ... 35.
MDS Drives ... 2 year warranty
(See page S)
6804 MDS 88 Removable Drive ... 599.
3603 MDS 88 Removable Cartridge ... 107.
3600 MDS 88 Removable Cartridge *(10 pack)* ... 999.
Micropolis ... 5 year warranty
(See page P)
8984 280 MB MICRODISK *(formatted)* ... 1589.
4415 550 MB MICRODISK *(formatted)* ... 1889.
4412 860 MB MICRODISK *(formatted)* ... 2395.
6808 1.1 GB MICRODISK *(formatted)* ... 2595.
8979 280 MB Internal Hard Drive *(15 ms)* ... 1149.
8978 550 MB Internal Hard Drive *(15 ms)* ... 1449.
5029 860 MB Internal Hard Drive *(15 ms)* ... 2159.
Peripheral Land, Inc. ... 1 year warranty
(See page N)
8887 CD-ROM Caddy *(single)* ... 14.
2531 CD-ROM Caddy *(10 pack)* ... 99.
8899 PLI CD-ROM Drive ... 695.
8890 1.2 GB Ext. Hard Drive *(15 ms)* ... 2795.
8891 320 MB Ext. Hard Drive *(11 ms)* ... 1895.
8888 330 MB Ext. Hard Drive *(17 ms)* ... 1749.
8889 600 MB Ext. Hard Drive *(17 ms)* ... 2095.
6432 3.5" Optical Media ... 65.
7143 Infinity Optical 3.5" 128 MB Drive ... 1695.
8893 Infinity 40 MB Cartridge Drive ... 669.
8894 Infinity Twin 40 MB Cartridge Drive ... 1195.
8905 SCSI 2 to Centronics Cable *(50 pin)* ... 49.
8547 Super Floppy 2.88 Drive ... 449.
4847 Infinity 88 Turbo ... 879.
2529 DAT Tape Backup ... 1999.

ACCESSORIES

Avery ... 60 day MBG
5392 3½" Diskette Labels *(Qty. 630)* ... $29.
Canon ... 90 day warranty
(See page S)
9811 512 MB Optical Cartridge MO-502m ... 175.
Curtis Manufacturing ... lifetime warranty
1718 3.5" Disk File *(DB-2) (holds 40)* ... 8.
5985 Safe Fax *(SF-1) (1 year warranty)* ... 19.
1707 Ruby *(SPF-2)* .. 55. 1708 Plus *(SPF-2+)* .. 59.
5832 Ruby Remote *(SPFR-2)* ... 65.
Fuji ... 60 day MBG
5505 3.5" ED Floppy Disk *(10 pack)* ... 59.
Hewlett-Packard ... 120 day warranty
8099 Toner Cartridge for NeXT Printer ... 95.
Memory ... 2 year warranty
(See page S)
8790 1 MB SIMM *(80ns)* ... 35.
9284 1 MB SIMM *(80ns, set of 4)* ... 140.
8910 4 MB Memory SIMM *(80ns)* ... 129.
1935 8 MB Memory Upgrade Kit *(for NeXTdimension, NeXTstation Color & NeXTstation Turbo)* ... 339.
8911 16 MB Memory Upgrade Kit *(four 4 MB)* .. 479.
8324 16 MB Memory Upgrade Kit *(four 8 MB)* .. 589.
Moustrak ... lifetime warranty
Mouspad: black, blue or gray *(7" x 9")* .. *ea.* 8.
Mouspad: black, blue or gray *(9" x 11")* *ea.* 9.
Moustrak L/F: blue or gray *(9" x 11")* .. *ea.* 10.
Pacific Micro ... 1 year warranty
8244 External Hard Drive Enclosure ... 469.
Sony ... 60 day MBG
3298 3.5" HD Disks *(10 pak)* 15. 6375 *(30 pak)* 42.
3614 3.5" ED Disks *(10 pak)* 65. 5030 *(20 pak)* 126.
SyQuest ... 60 day MBG
6592 SyQuest Cartridge *(44 MB)* ... 69.
3603 SyQuest Cartridge *(88 MB)* ... 107.
5531 SyQuest Cartridge *(88 MB) (3 pak)* ... 312.
5530 *(5 pak)*..... 512. 3600 *(10 pak)* ... 999.
Toshiba ... lifetime warranty
(See page R)
4858 3.5" ED Floppy Disk *(5 pack)* ... 29.
9755 3.5" ED Floppy Disk *(10 pack)* ... 55.

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Tales from the Crypt

SIMSON L. GARFINKEL

Privacy of personal and business communications and security from being overheard are two features demanded by computer users in the 1990s. But two U.S. government bureaucracies don't want the best technology to find its way into the hands of U.S. citizens and companies.

One of the most eagerly anticipated features of NeXTSTEP 3.0 was encryption for electronic mail and files. The promise was that any NeXTSTEP user anywhere in the world would be able to send a private, secure e-mail message to any other NeXTSTEP user. The message would be unreadable by anyone but the intended recipient, so if the message accidentally got bounced into some postmaster's mailbox – or intercepted by a corporate spy – no damage could be done.

NeXT's Fast Elliptic Encryption technology works. It works so well, in fact, that Uncle Sam won't let NeXT export it.

Under current U.S. law, the State Department has an absolute veto over the export of any computer program that lets a person encrypt or decrypt a message. The law – a holdover from the Cold War – places PC programs that allow encryption in the same category as munitions.

The irony is that federal law allows the free export of books and magazine articles describing encryption algorithms; it's only programs using those algorithms that can't be sent overseas. These export restrictions translate directly into lost sales for U.S. companies.

The State Department restrictions on cryptography stem from recommendations of the National Security Agency (NSA), a part of the Department of Defense so secret that even its budget is classified.

It is widely believed that the NSA monitors between one and ten percent of all international telecommunications activity originating within the United States. If U.S. companies used good encryption technology to communicate with their overseas subsidiaries, it would make the NSA's job of monitoring those communications much more difficult.

"The NSA has a job to do," says Jim Bidzos, president of RSA Data Security in Redwood City, California, a vendor of encryption systems. "It sees the uncontrolled proliferation of good cryptography as the biggest threat to its mission.

This July, the Software Publishers' Association (SPA) cut a deal with the NSA to allow the export of mass-market computer programs that performed encryption with RC2 or RC4, two cryptographic algorithms also developed by RSA Data Security. But the deal is really a sham: Under the agreement, the key size is limited to 40 bits. That's more security than a Captain Crunch decoder ring – but not much more. A network of 1000 NeXTstations could forcibly decrypt a message encoded with RC2 and a 40-bit key in less than three days.

"It's not as bad as it sounds," says Bidzos. But, he adds, "if I were a using a product [with a 40-bit key], I wouldn't put anything in there that was extremely sensetive. People can escrow your messages – store them away – and break them in a few years, when 40 bits is trivial."

The sad fact is that the NSA won't let U.S. companies export any cryptographic system that the agency itself can't break. But computers are evolving quickly. If the NSA can break a code today, your competitors can tomorrow.

The SPA deal came too late for NeXTSTEP 3.0. But it might not even matter: Many people inside NeXT seem to feel that no encryption would be better than bad encryption. So don't expect to see encryption in NeXTSTEP anytime soon. And if you're a NeXTSTEP developer in the United States, don't put encryption capabilities into your products unless you plan to offer a version without encryption for sales overseas. Alternatively, you can move your development operations to Europe – where there are no such restrictions – and export software to the United States.

While the NSA is trying to keep software that provides mathematically secure communication from being exported, the FBI and the Attorney General are trying to prevent the dissemination of secure communications systems within the country.

The issue is wiretapping. Ever since 1968, the FBI has been legally allowed to wiretap telephones if it first obtained a court order. But rapid advances in telecommunications technology are making it harder and harder for those orders to be carried out.

To prevent that from happening, the FBI early this year introduced a "Digital Telephony" proposal that would require makers of communications systems – everything from telephone switches and fax machines to computers – to build provisions for wiretaps into their systems. The newest draft of the legislation, being privately circulated by the Office of Management and Budget, essentially requires companies that sell both hardware and software to make their systems "wiretap ready."

The FBI's proposal directly applies to NeXTSTEP programs like Mail and Adamation's LiveWire. Why? Because right now, two individuals negotiating a drug transaction could circumvent an active wiretap by conducting their conversation over a modem with two NeXTstations. Even if the FBI recorded every modem blip, piecing together the text of the conversation from a sea of protocols would prove to be formidable task.

Civil libertarians are charging that making wiretaps easier for the FBI will make it easier for industrial spies as well. Furthermore, says Marc Rotenberg, director of the Washington, DC, office of Computer Professionals for Social Responsibility, "the FBI has mischaracterizied the legal status of wiretap authority. It is an investigative method of last resort. To treat it as a design goal of first priority is to stand the law on its head."

"The cat is already out of the bag," says Mitch Kapor, founder of the Electronic Frontier Foundation. "There are 80 million PCs, and uncounted tens of thousands of software packages, all of which are capable of playing a role in communications. Given that we have mathematical ways of making totally secure communications, how is law enforcement going to be able to do its job? That's a profound question for which there aren't ready answers at hand."

SIMSON L. GARFINKEL, *a* NeXTWORLD *senior editor, is coauthor of* NeXTSTEP Programming *(Springer-Verlag, 1992).*

PHOTOGRAPH BY VOLDI TANNE

USE

Upgrading System Memory

by DANIEL MILES K

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Shopping for memo

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WORLD senior editor, is
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USERS

Upgrading System Memory

by DANIEL MILES KEHOE

There's a simple rule of thumb with NeXTSTEP: The more memory you plug into your computer, the faster it will run. NeXT says that 8MB is enough for most applications that most users want to run. But running NeXTSTEP on an 8MB system is tight. By itself, the Mach kernel takes up 1.5MB. The Display PostScript Window Server takes up another three or four, and Workspace Manager another two. That leaves only 2MB or so for your applications before your computer starts doing more paging (swapping programs to disk) than thinking.

With an 8MB system, you'll hear your hard disk rattle every time you switch between application programs. This becomes less noticeable on a 16MB system and all but vanishes on systems with more memory.

Shopping for memory

If price is a factor in your purchase decision, you'll want to consider mail-order memory merchants. These suppliers buy carloads of raw chips from Japan, insert them on tiny SIMM circuit boards, and sell their wares cheaply. Unfortunately, not every memory merchant sells SIMMs that fit the NeXT, and many vendors cannot provide proper technical assistance for NeXT users. But if you find a mail-order vendor with whom you are comfortable, chances are good that it will offer a competitive price. As this is written, you can purchase 4MB SIMMs for 25MHz monochrome NeXTstations for about $100 and 8MB SIMMs for Turbo Color systems for about $225.

Different NeXT systems require different SIMM types. For a 16MB memory upgrade of older (motherboard serial number AB0028000 or lower) monochrome 25MHz NeXTstations, you need four, 4MB nonparity, 4-by-8, 80-nanosecond (or faster), vertically mounted, 30-pin SIMMs. The same SIMMs can be used in an '030 NeXTcube, but they must be low-profile parts, with a height that does not exceed 0.9 inches. (These are the same SIMMs that are used in many Macintoshes, but not the Mac IIfx.)

For an 8MB memory upgrade for a NeXTstation Color, NeXTstation Turbo (either monochrome or color), or newer NeXTstations, you need two 4MB nonparity, 1-by-32, 72-pin, 70-nanosecond (or faster) SIMMs. Both single- and double-sided SIMMs are compatible.

Check for a year (or longer) guarantee, a 14-day swap policy (should a new SIMM be dead on arrival), and immediate availability. If you're buying mail-order, be prepared to pay extra for the privilege of using a charge card.

Parity

Parity SIMMs have an extra bit that the NeXT computer uses to check for errors as data is read out of memory. NeXT '040 computers automatically detect the ninth bit and use it.

Using parity SIMMs increases the reliability of your computer: If a memory error occurs, your computer will instantly crash, easily alerting you to a problem. Without parity SIMMs, your computer might continue to hobble along with memory errors; some applications might mysteriously fail while others might corrupt data.

On 25MHz NeXTstations, parity memory runs slightly slower than nonparity. Parity checking is done in parallel on the new Turbo systems, so there is no performance penalty for using it. If you want to be absolutely sure of your system's integrity, get parity memory. For ordinary applications, parity memory is not needed.

Rolling up your sleeves

NeXT's official position on user-installed memory is simple: *"Upgrades should be performed only by an Authorized Service Provider."*

That doesn't mean you can't use third-party memory. Even going by the letter of the law, you can order memory from a trustworthy mail-order house and pay your authorized reseller's standard rate for labor. Your reseller may raise an eyebrow but will probably do the work when paid.

On the other hand, you might try to do your own upgrade. But be warned: Do any damage, and you'll void NeXT's warranty.

Installing memory

Static electricity destroys memory chips. To be free of unwanted sparks as you move about the inside of your computer, you should don an antistatic wrist strap and connect it to the computer. Radio Shack – and memory vendors – sell antistatic straps for a few dollars.

Upgrading an 8MB monochrome NeXTstation requires that you remove the four SIMMs nearest the computer's power supply. A SIMM-removal tool, which looks a lot like a dentist's pick, is absolutely necessary. Never use a screwdriver to pry out SIMMs.

Carefully press the new SIMMs into place, making sure they're fully seated. Finally, replace the cover and plug back in the computer. Close up the computer and the NeXT automatically recognizes its new memory and configures itself accordingly. To test the newly installed memory, follow these steps:

1. When you switch on the power and see the "Testing System" message, press Command-Command-tilde (~). This brings up the system ROM monitor with the "NeXT>" prompt.

2. Type **m** to initiate an extended test of the computer's memory configuration. If your installation was successful, you'll see a list of the memory sockets and what's in them.

Here are some companies known to have NeXT memory:

STRATUM TECHNOLOGIES	512/258-3570, 800/533-1744
NEXTCONNECTION	603/446-7771, 800/800-6398
SOUTH COAST ELECTRONICS	714/669-9503, 800/289-8801
THIRD WAVE COMPUTING	512/832-8282, 800/284-0486
MEMORY INTERNATIONAL	714/588-0488, 800/266-0488
CLEAR POINT COMPUTERS	508/435-2000, 800/253-2778
SHEECOM COMPUTERS	714/637-4800, 800/366-4433
CHIP MERCHANT	619/268-4774, 800/426-6375
MEMORY PLUS	508/366-2240, 800/388-7587
TECHNOLOGY WORKS	512/794-8533, 800/688-7466
IMPEDIMENT	617/837-8877
MICRO ELECTRONIC TECHNOLOGIES	508/435-9057, 800/766-7466
PERIPHERAL OUTLET	405/332-6581, 800/332-6581
ETC	813/884-2863, 800/882-2863

DANIEL MILES KEHOE *is a contributing editor to* NeXTWORLD.

PHOTOGRAPH BY VOLDI TANNER

USERS

Hints and Tips

by ROHIT KHARE

Upgrade3.0.app

The lowdown on the upgrade. To upgrade from NeXTSTEP 2.x to 3.0, quit all other applications, log in as **root** and run UpgradePrep from the floppy disk. This upgrades the Mach kernel and the PostScript interpreter. Then power down the computer, place the CD-ROM upgrade in its caddy, and position the caddy in the CD-ROM drive. Connect the drive to the computer as specified in your manual and power it up. Now power up the computer.

From this point on, do not eject the CD-ROM for any reason. During the reboot, the computer should recognize the new drive, and when you log back in as **root**, the CD-ROM should appear in the root directory ("/") after a minute or so. Now launch the Upgrade3.0.app. The computer will take about 15 minutes reading the contents of your current start-up disk and the CD-ROM.

You will now have two choices: Edit Plan or Upgrade. If you go ahead and click Upgrade, you will lose one item from the 2.x standard release (**/usr/bin/jot**) and several items from 2.x Extended (many demos and several examples, all in **/NextDeveloper**; TranScript configuration databases; and several DSP utilities in **/usr/bin/dsp***). If you wish to save these files or are just curious, click Edit Plan. You can now select All Files from the pop-up list and see, on a file-by-file basis, what will be upgraded and what will be lost. You only need to worry about the files with dashes in front of their names – all of your other files will be copied into the directory **/UpdatedFiles**.

Once you're satisfied, make sure all other apps have been shut down and click Upgrade. The process will now take two to three hours for a full upgrade. Do not disturb Upgrade3.0.app while it is running.

DataPhile 1.0

Graphic envelopes. Want your envelopes to sport your logo? Your mug shot? Just drag the file over the envelope and drop. Or draw it yourself using DataPhile's built-in graphics tools. Enter Design Mode, edit the Envelope Report generator, and choose Tools Palette from the Tools menu. To edit the characteristics of selected graphics, bring up the Inspector panel.

Another pair of handy tips for graphics in both DataPhile and Create: Pressing a Command key while dragging will override any grid constraints you may have set, and pressing an Alternate key while dragging a control handle ensures that the graphic scales with the original proportions.

Incrementing records. To create a field that increments every time you add a new record to the database, just create a text field that has a "+" (plus sign) at the end of its default text. Simply enter the Design Mode, select the field you want to automatically increment, click the Options button, and type your default text. Every new record you create will have successive values of this serial pattern.

Diagram 1.1

Using palettes. Do you keep dragging items off the palette and have to reset their attributes every time? Just command-click the object in the palette, and you can inspect and manipulate the object itself. The next time you drag that item off the palette, it will have the attributes you set.

Appsoft WriteNow 2.0

Compressing .wn files. Press Alternate-Command-s instead of Command-s, and WriteNow will remove unreferenced graphics and the backup file it keeps inside your **.wn** document. Note that the Revert to Backup menu choice is dimmed afterward. This option also ensures that text you delete is also wiped clean from the disk.

Rewriting the date. Not satisfied with the "Thu Jul 02 1992" provided by Insert Date? If you would prefer a "Thursday, July 02, 1992" format, type the following into a Terminal window:

```
dwrite GLOBAL NXDate "%A, %B %d, %Y"
```

WordPerfect 1.0.1

Instant Improv tables. If you miss the Tables feature available in WordPerfect 5.1 on other platforms, there's an easy workaround for Improv users. Just select your table in Improv, choose Copy as Graphic, and paste it into WordPerfect. A caveat: You won't be able to edit the table once you paste it in, so be sure to keep your original handy.

Controlling word spacing. When you force text to be justified, WordPerfect adds or subtracts small spaces between words to even up the ends of lines. If you notice that words are getting jammed too close together, or that you could drive a truck between your prepositional phrases, it's time to get out the Align Options panel from the Align menu. If spacing is too tight, raise Compression from its default of 60 percent to 100 percent; now WordPerfect won't try to move your words any closer together than normal. Similarly, slash Expand from 400 percent (four spaces) to about 130 percent.

ROHIT KHARE *is a 17-year-old sophomore in computer science at the California Institute of Technology.*

USERS

NeXT Question

by DAN LAVIN

Q: Do I have to pay for Release 3.0? What if I just get it from a friend?

Name withheld
Dallas, TX

A: *Yes, you do have to pay for Release 3.0 and no, you can't just get it from a friend. NeXT says that its licenses from AT&T, Adobe, and Pixar preclude free distribution. If you install only the basic system, however, you can get the developer system at no additional cost from any source you choose. Considering that the 3.0 CD-ROM contains 200MB of software and files, the $295 upgrade price is quite low – roughly $1.50 a megabyte.*

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- ❑ 8) MIS/DP, tech. services or tech. documentation
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- ❑ 10) IBM or compatible
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NeXTWORLD

DEVELOPE

Using 3.0'
Drag-and-
Drop Facil

by GREG BURD

pasteboard, and improveme
changes, you can drag and

What a drag

NeXTSTEP 3.0 has two ne
Drag deals with dragging fi
gram, or between programs

The Drag category is w
tation of data within an ap

```
@interface View(Drag)
- dragImage:anImage
        at:(NXPoint *)viewLoc
        offset:(NXPoint *)initi
        event:(NXEvent *)even
        pasteboard:(Pasteboa
        source:sourceObj
        slideBack:(BOOL)slide
- registerForDraggedTypes:
        count:(int)numTypes;
- unregisterDraggedTypes;
@end
```

The first method, **drag**
dragging begins. First, "dra
stance that you want to be
viewLocation" is a point ir
should be relative to the im
end up using {0.0, 0.0}. Th
mouse's current location re

Remember that we are
than the data itself. The da
have to create a pasteboar
put the data on it before ca
used to get the drag-source
and this is usually **self**. If y
is aborted, then set **slideBa**

Typically, you'll call **d**
The user will click an imag

On the receiving end,
NeXTSTEP which drag ty
method in **initFrame:**. This
board information your su
tion. The structure is the s
So if you want to accept P

```
*const types[] = {NXPostS
[self registerForDraggedT
```

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DEVELOPERS

Using 3.0's Drag-and-Drop Facility

by GREG BURD

Drag-and-drop is an integral part of any NeXTSTEP application. But until now, implementing it was beyond the abilities of all but the best programmers.

With NeXTSTEP 3.0, adding drag-and-drop capabilities to an application is almost as easy as, well, drag and drop. That's thanks to a few new categories in the View class, some extensions to the pasteboard, and improvements in the NXImage class. With these new changes, you can drag and drop just about anything.

What a drag

NeXTSTEP 3.0 has two new View categories: IconDrag and Drag. IconDrag deals with dragging file icons – either from the workspace to a program, or between programs. Using it is fairly straightforward.

The Drag category is what you use when dragging a visual representation of data within an application. There are three methods:

```
@interface View(Drag)
- dragImage:anImage
        at:(NXPoint *)viewLocation
        offset:(NXPoint *)initialOffset
        event:(NXEvent *)event
        pasteboard:(Pasteboard *)pboard
        source:sourceObj
        slideBack:(BOOL)slideFlag;
- registerForDraggedTypes:(const char *const *)newTypes
        count:(int)numTypes;
- unregisterDraggedTypes;
@end
```

The first method, **dragImage:**, is the method with which all visual dragging begins. First, "dragImage:anImage" passes an NXImage instance that you want to be displayed while dragging. The "at:(NXPoint *) viewLocation" is a point in the View that represents where the mouse should be relative to the image being dragged. Most of the time you will end up using {0.0, 0.0}. The "offset:(NXPoint *)initialOffset" gives the mouse's current location relative to the mouse-down location.

Remember that we are dragging a visual representation of data rather than the data itself. The data itself is placed on the pasteboard, so you have to create a pasteboard suited for dragging. Use NXDragPboard and put the data on it before calling **dragImage:**. The "source:sourceObj" is used to get the drag-source operation (NX_DragOperationCopy, etc.), and this is usually **self**. If you want the image to slide back if the operation is aborted, then set **slideBack:**(BOOL) to YES.

Typically, you'll call **dragImage:** in response to a **mouseDown:** event. The user will click an image and then drag it away. It's that simple.

On the receiving end, the new method **registerForDraggedTypes:** tells NeXTSTEP which drag types your View can accept. You should call this method in **initFrame:**. This method tells the View class the types of pasteboard information your subclass of View will accept during a drag operation. The structure is the same as the **types** argument to the OpenPanel. So if you want to accept PostScript and TIFF images, use:

```
*const types[] = {NXPostScriptPboardType, NXTiffPboardType};
[self registerForDraggedTypes:types count:2];
```

The drag session

When the user drags something into an appropriate receiving View, that View gets sent a series of six messages. The messages are defined in the new NXDraggingDestination protocol. (A protocol defines a set of messages to which an Objective-C class can respond, but which the class must define for itself. It's a new extension to the Objective-C language that was invented for NeXTSTEP 3.0.)

-(NXDragOperation)draggingEntered:(id <NXDraggingInfo>)sender

This is the first message that your View will receive when the dragged object first enters your View; "sender" is an object that can respond to the NXDraggingInfo protocol. Your View should use this method to verify that it can actually receive what is being dragged into it. The return type, NXDragOperation, is an enumerated type that indicates which operation the destination will perform when the object is released.

-(NXDragOperation)draggingUpdated:(id <NXDraggingInfo>)sender

This message gets sent while the user moves the dragged object around the receiving View.

What happens next depends on if the user drags the object out of the receiver or releases the mouse button. If the dragged object leaves the receiver, then the **draggingExited:** message is sent.

If the user releases the dragged object inside the receiving View, the following three messages are sent in sequence:

-(BOOL)prepareForDragOperation:(id <NXDraggingInfo>)sender
-(BOOL)performDragOperation:(id <NXDraggingInfo>)sender
-concludeDragOperation:(id <NXDraggingInfo>)sender

If your View returns NO to either of the first two messages, the drag operation will be aborted.

Getting info

You can use the NXDraggingInfo object to find out what is actually being dragged by the user. The six NXDraggingDestination methods shown above all receive an NXDraggingInfo object as their argument; you never create an NXDraggingInfo object yourself.

Some of the more helpful methods included in this object are:

-(NXImage *)draggedImageCopy

This returns a copy of the NXImage object that's being dragged. Be sure to free the NXImage object when you're done with it.

-(NXPoint)draggedImageLocation

This tells you the origin of the image that is currently being dragged.

-(Pasteboard *)draggingPasteboard

This returns the pasteboard specified by the first **dragImage:** message that started dragging in the first place. Use it to get at the user data associated with this drag.

-(BOOL)isDraggingsourceLocal

This returns YES if the drag source and destination are in the same application, which under NeXTSTEP 3.0 is not necessary. This is why you can now drag color chips from one application to another.

Demonstration

We've put a dragging lab to show how all of this works on the archive servers **cs.orst.edu** and **sonata.cc.purdue.edu.** Look for the file **NeXTWORLD_DragLab.tar.Z.**

GREG BURD *works in NeXT developer support.*

DEVELOPERS

Hints and Tips

by Andrew Stone

Although NeXTSTEP 3.0 promises binary compatibility with NeXTSTEP 2.1 applications, developers have a little work to do to get their 2.1 applications to recompile in the new OS. Once you've done the conversion, you'll be rewarded with smaller and cleaner code that compiles faster.

Stop! Before you do anything, make backups of all of your existing source directories. Once you open a file with 3.0's Interface Builder (IB), you won't be able to open it again with the 2.1 version.

Choose a program to convert and double-click its **IB.proj** file. Project Builder (PB) will start up and convert **IB.proj** into **PB.proj**. The new program takes over all of IB's project-management functions, like maintaining the Makefile, making the new IB simpler and cleaner. The **.nib** files will be automatically converted when you edit them.

To create a new project, follow these steps:

1. Launch both PB and IB.
2. Make a new file by pressing Command-n in IB.
3. Save it in a new directory with the same name as your app.
4. Edit your **.nibs** by double-clicking their names in PB's browser.
5. New classes will be automatically added to your project as you create them inside IB.

Precompiled headers

NeXTSTEP 3.0 now has precompiled headers, which means that the class definitions for the entire Application Kit get brought into your program with the one statement:

```
#import <appkit/appkit.h>
```

Be sure that this is the first **#import** in your source file, or else the precompiled headers won't work properly.

You can also precompile your own headers, which avoids having to #import 15 or 30 different files and speeds compiling as well. For Stone Design's 3DMan, I created this **ProjectIncludes.h** file:

```
// System include ?????files
#import <appkit/appkit.h>
#import <bsd/sys/dir.h>
#import <3Dkit/3Dkit.h>

// Your commonly needed objects:
#import "cFunctions.h"
#import "localization.h"
#import "SDLibBundle.h"
```

Then I added these lines to my **Makefile.preamble** file:

```
# name of precompiled header created:
$(OFILE_DIR): 3Dincludes.p

# set this to the path where the includes live
FILEPATH = /Net/blackhawk/Projects/3Dman

# the makefile command
3Dincludes.p: $(PSWFILES:.psw=.h) $(CLASSES:.m=.h) $(HFILES)
cc -precomp $(CFLAGS) $(FILEPATH)/3Dincludes.h
```

New locations of #include files

NeXT has moved around all of its **#include** files, placing most of Berkeley's into **/usr/include/bsd**. If you try to compile your old code without modification, you'll see a lot of these warning messages:

```
/NextDeveloper/2.0CompatibleHeaders/cthreads.h:1: warning:
Compatibility file included, use <mach/cthreads.h>
```

The way around this problem is to comment out all of the **#include** and **#import** statements in your code and replace them with a single **#import <appkit/appkit.h>**. (Don't worry – most of the things that you might want to import have already been precompiled into **appkit.h** anyway). Add back the old **#import** and **#include** directives only if needed.

Objective-C comments in .c files

NeXTSTEP 3.0 ships with GNU C Compiler version 1.96, which is much pickier about its input source. For example, you can no longer have Objective-C statements in files with a .c extension.

Fortunately, there are two simple workarounds. Either change all of your **.c** files into **.m** files, or include this line in your **Makefile.preamble**:

```
CFLAGS = -ObjC
```

Allowing an empty selection in a radio matrix

NeXT has changed some class names for consistency with the rest of the AppKit. For example, the Matrix method **allowEmtpySel:(BOOL)flag** has now been replaced with two methods: **setEmptySelectionEnabled:(BOOL)flag** and **(BOOL)isEmptySelectionEnabled**.

Interapplication messaging with remote objects

Say goodbye to having to use the AppKit classes Speaker and Listener. NeXTSTEP 3.0 now allows you to send messages directly to the Workspace Manager (and other apps) to make it do what you want.

For example, if you want to get an NXImage for a file icon under NeXTSTEP 3.0, you can simply do this:

```
image = [[Application workspace] getIconForFile:fileName];
```

Andrew Stone is president of Stone Design.

DEVELOPERS

NeXT Question

by Simson L. Garfinkel

Q: Pantone colors are great, but how do I access them from my program?

Orca Starbuck
Cambridge, MA

A: *NeXTSTEP 3.0 introduces a new Objective-C class called NXColorList, which NeXTSTEP uses to manage color lists. By default, NeXTSTEP only comes with one color list – Pantone – but you can create your own.*

To access a Pantone color by number, you must first get the id of an NXColorList object associated with the list. Use:

```
id    plist = [NXColorList findColorListNamed:"PANTONE"];
```

Then, to access color "5-3", you can use:

```
NXColor pcolor = [plist colorNamed:"5-3"];
```

To see the names of all the Pantone colors, try:

```
int   i;
for(i=0;i<[plist colorCount];i++){
      printf("color #%d is %s\n",[plist nameOfColorAt:i]);
}
```

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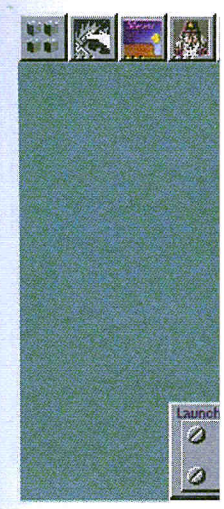

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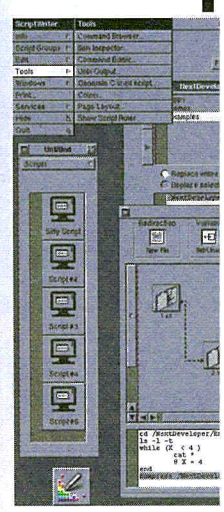

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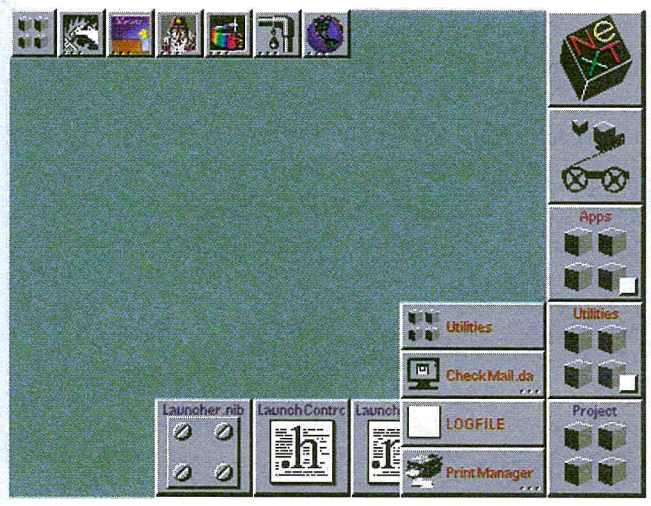

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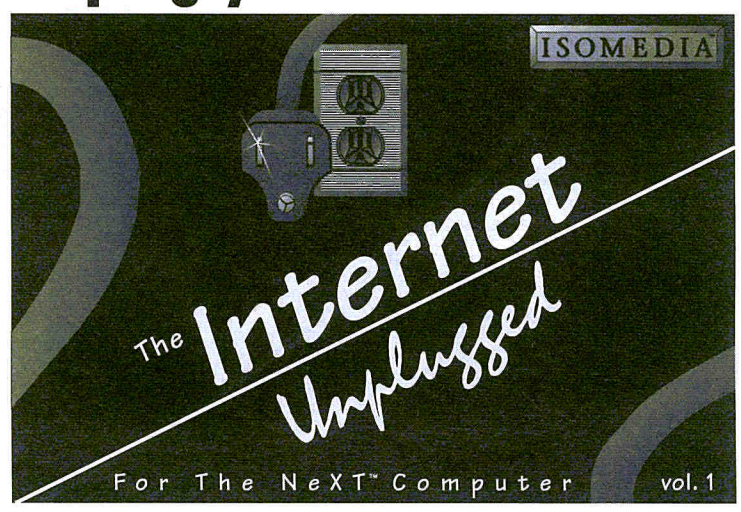

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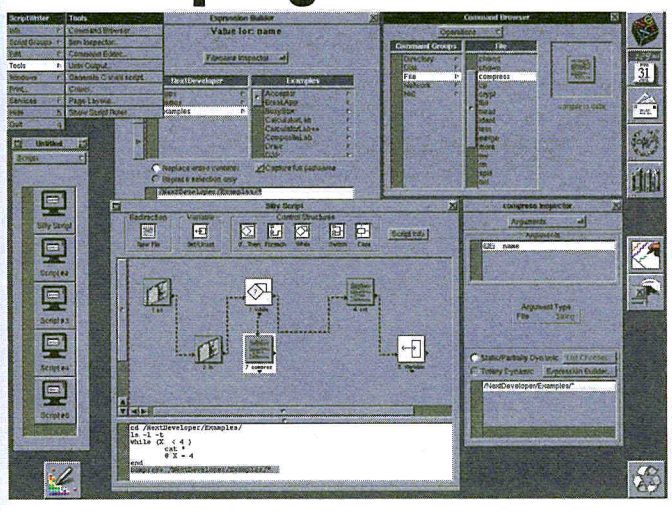

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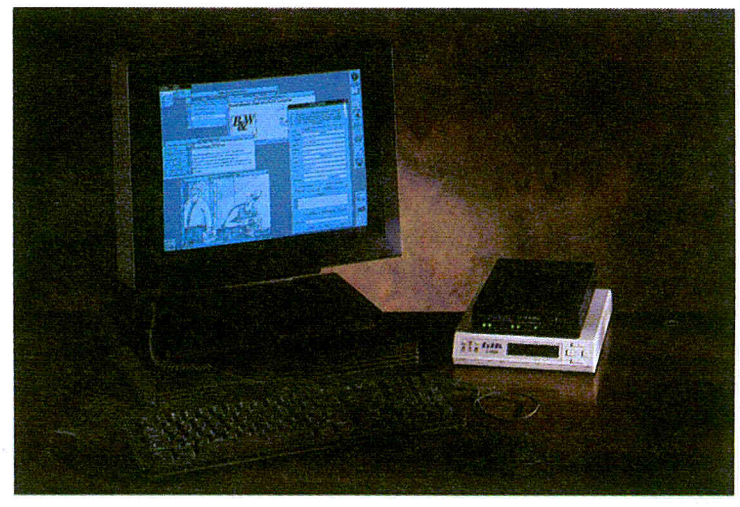

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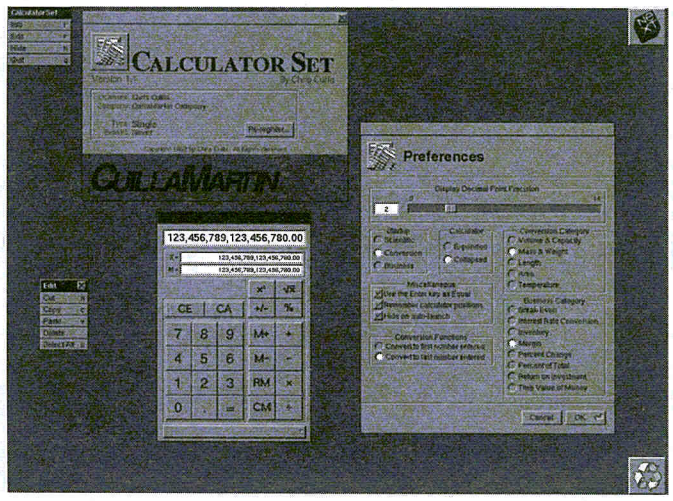
CuillaMartin Calculator Set 1.1



Unable to sit still, we've improved our Calculator Set. Version 1.1 now offers refinements that makes using our calculator better than any other. We still have Basic, Scientific and Conversion, but now we've added to Scientific and improved Basic, plus we've included new Business features. We're also NeXTSTEP 3.0-savvy, including NeXT Help!
So...to get a demo, we'd be glad to send one, just call us, or to order, contact NeXTConnection (800.800.6398) or your local NeXT Reseller.

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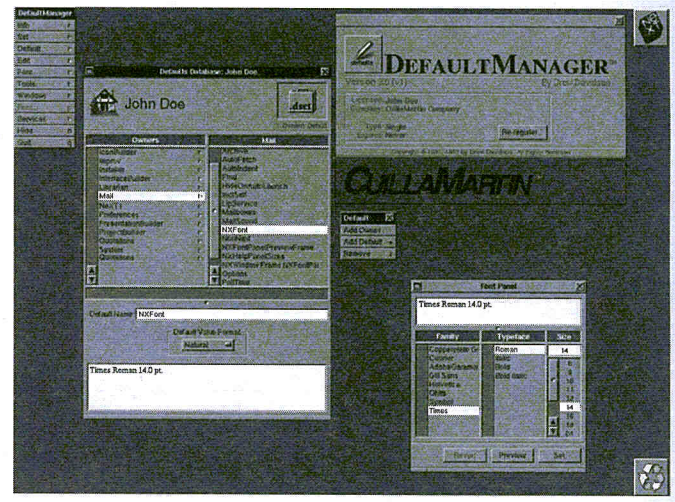
DefaultManager 3.0 from CuillaMartin



Now there's a new, fully supported version of DefaultMgr by Drew Davidson. Version 3.0 is the perfect tool for managing NeXT defaults.
If you're a NeXT programmer always purging defaults, a system administrator managing defaults for a network or a user needing to manage application defaults, this is the tool for you!
So...to get a demo, we'd be glad to send one, just call us, or to order, contact NeXTConnection (800.800.6398) or your local NeXT Reseller.

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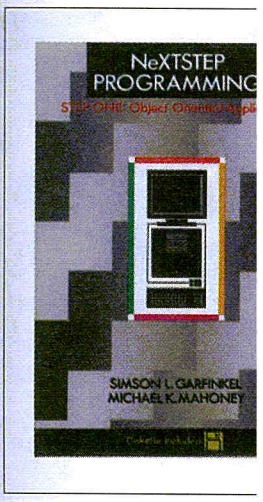

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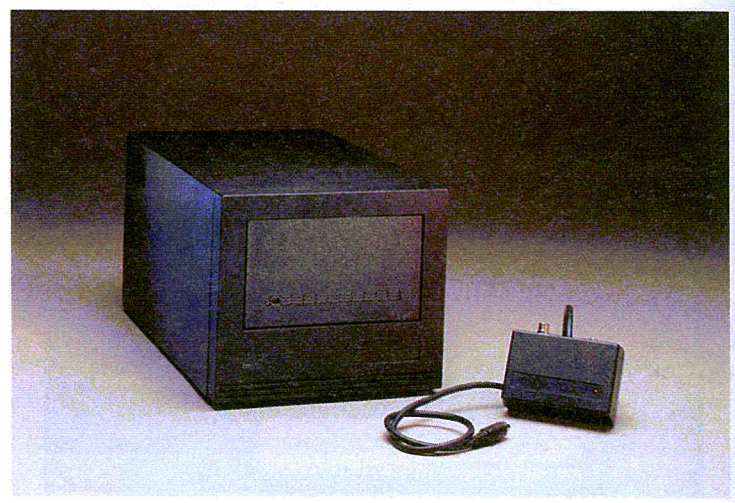

Left: The custom-formatted hard drives that made our reputation in the early days of the NeXT. Pre-tested, plug and play, optional auto-power-on; includes all cables and unlimited 800# support. Prices start at $1195. (Old external case shown above)
Right: Our NeXT phone interface. Bundled with Voilà, our new cutting-edge, object-oriented, visually programmed phone/voice-mail environment. With Voilà, even non-programmers can make their dreams come true! Voilà runs on *any* phone hardware, including the Hayes ISDN eXTender. Shipping late Q3.
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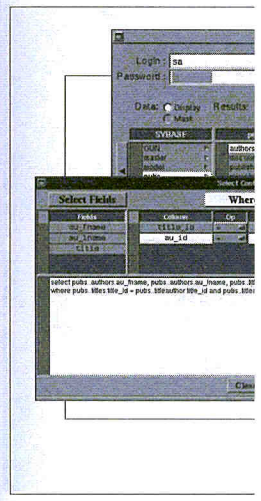

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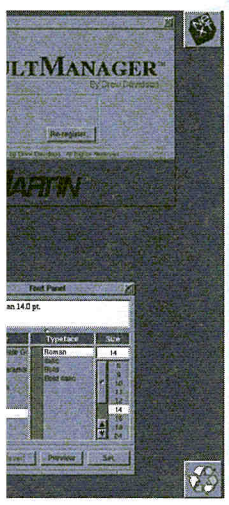

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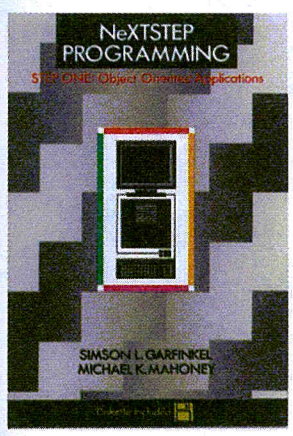

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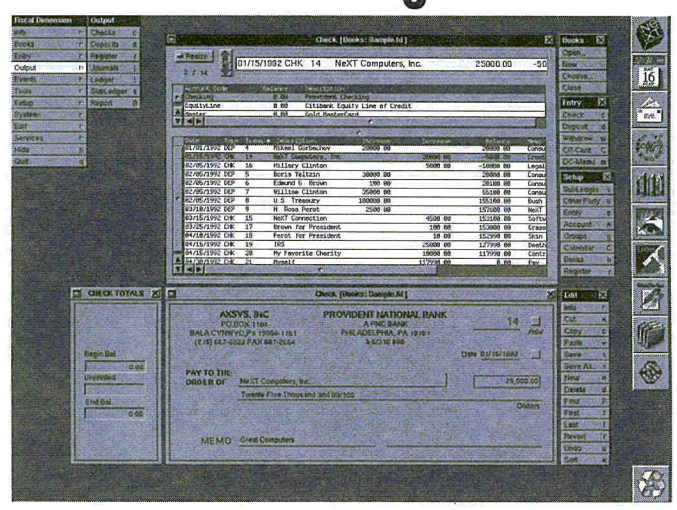

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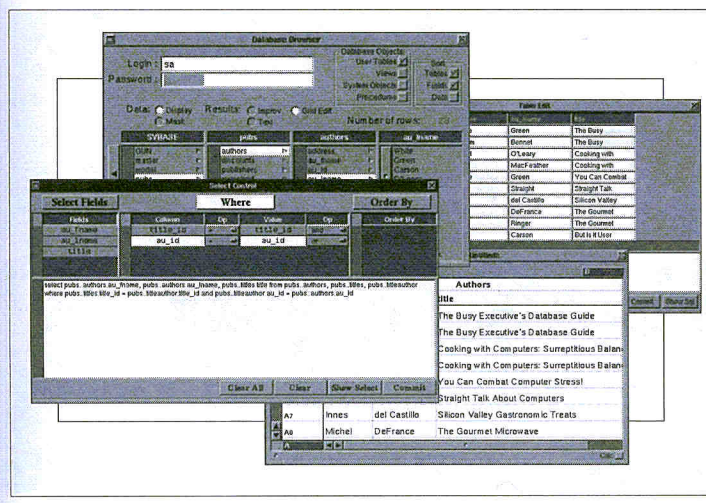

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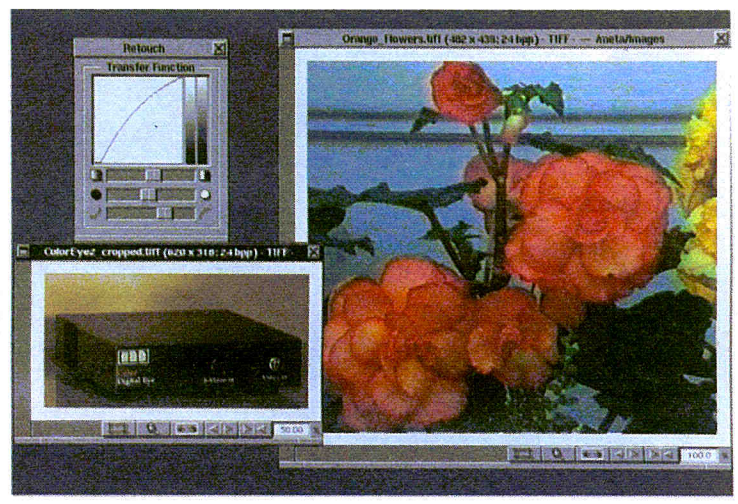

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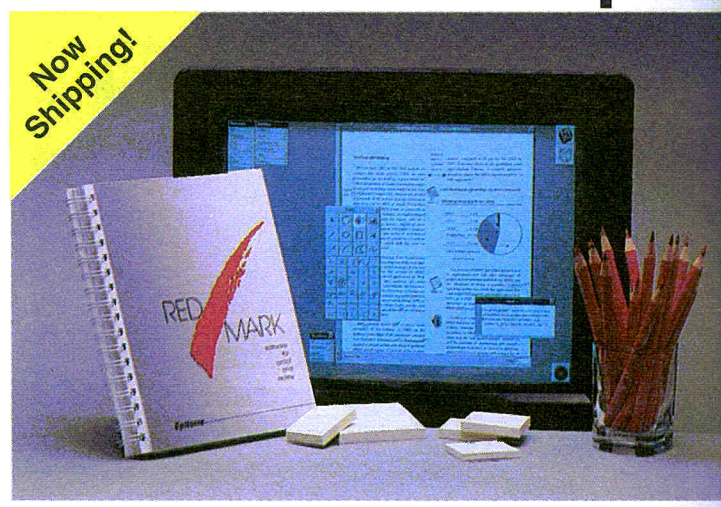

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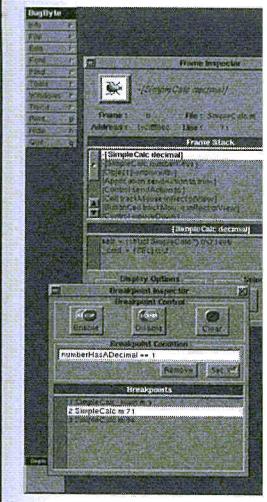

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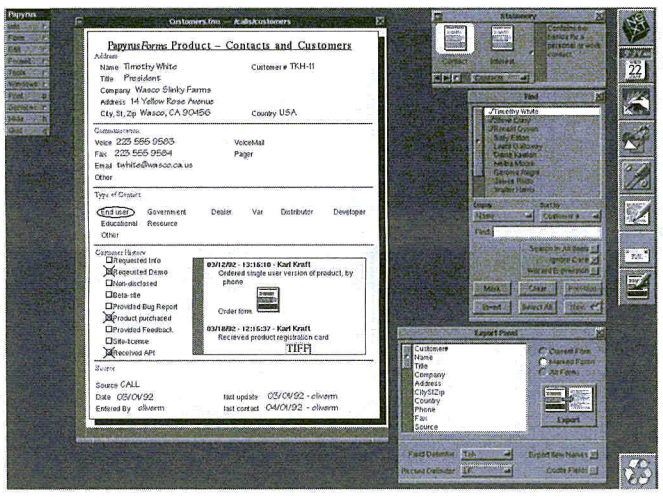

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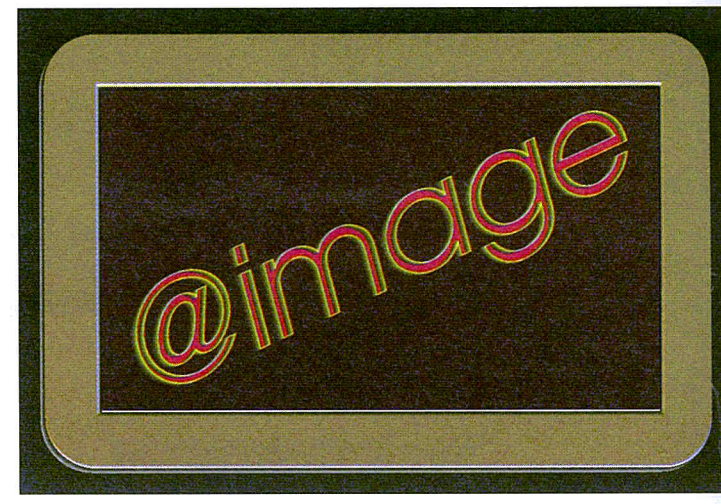

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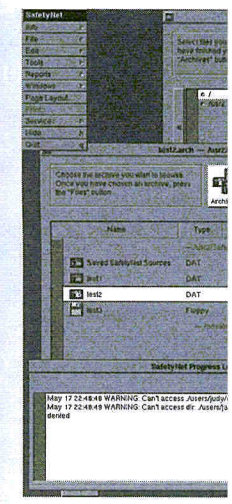

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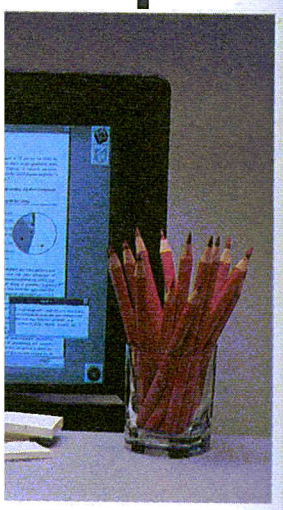

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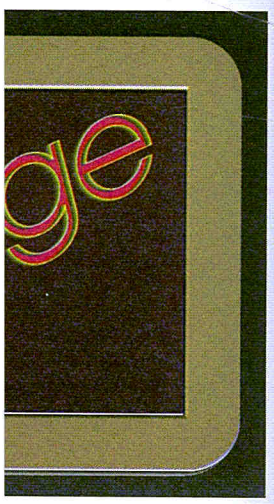

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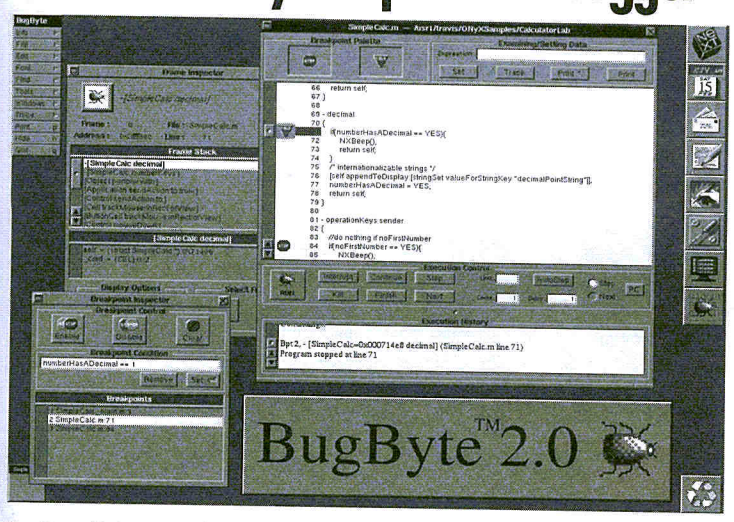

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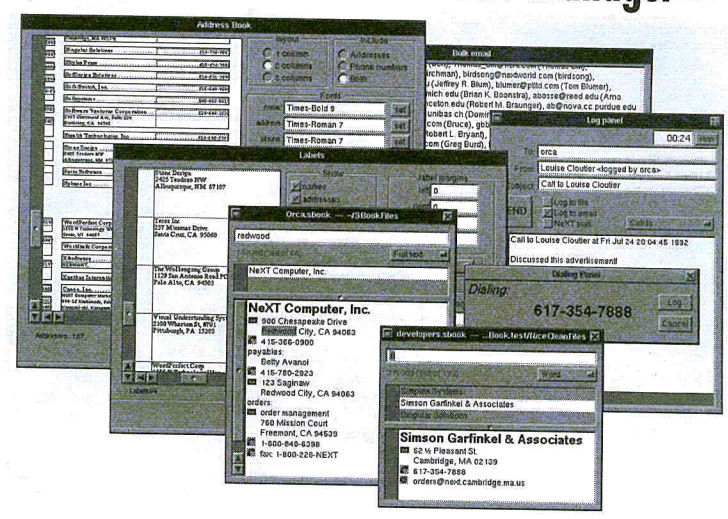

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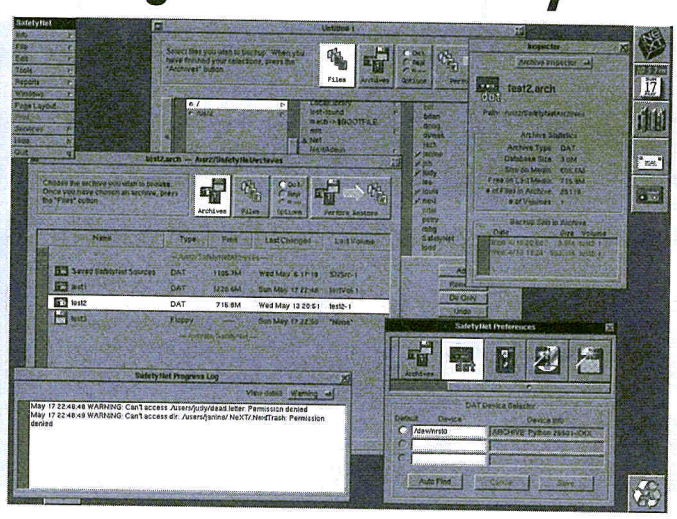
Working Without a SafetyNet?



SafetyNet is comprehensive backup and archiving software for your NeXT. File selection is as easy as drag and drop while restoring files is effortless and fast because SafetyNet always knows where files are on backup media. Average access time to a file on DAT, for instance, is well under one minute. Doing the same backup often? Then create a backup profile in SafetyNet and just double click it anytime you want to execute it. SafetyNet/Personal, priced at only $99, is perfect for standalone NeXTs. SafetyNet/Professional, at $399, can be used to backup entire networks of NeXTs.

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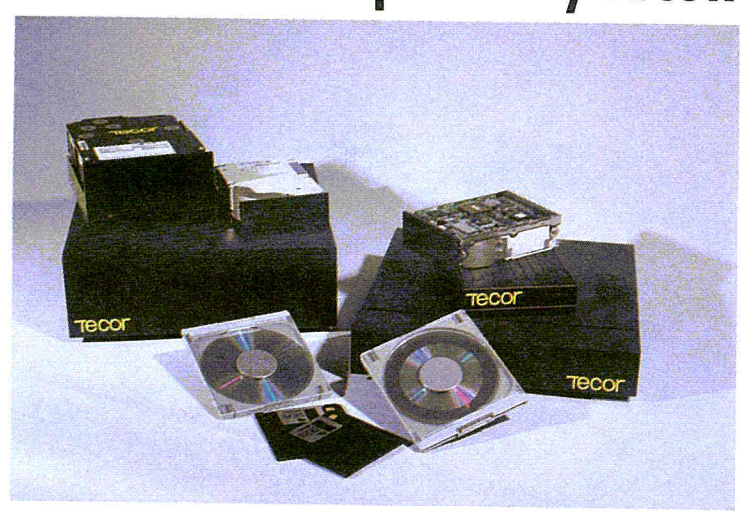

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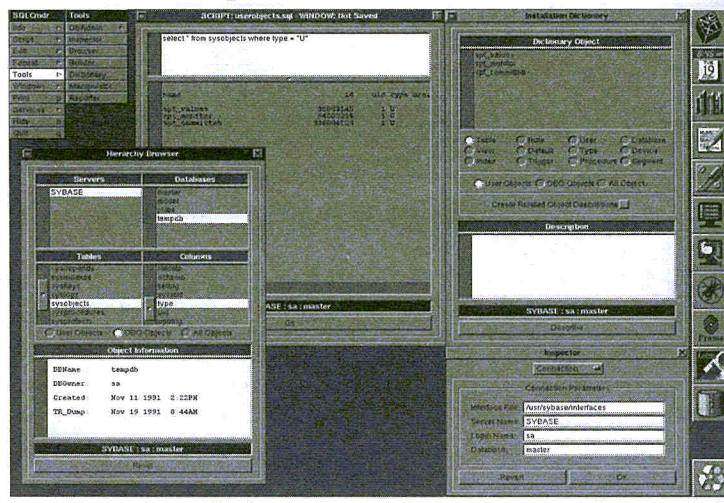

DBCommander™ fills the gap between your RDBMS installation and the DBKit development environment. While DBKit does not provide database administration or query and data dictionary access to your database servers, DBCommander™ provides functionality to maximize both database software development and administration. DBCommander's multi-threaded tools support SQL scripts, query building, database browsing, and more. Complete database administration tools for SYBASE® are currently available. DBSA is also available for systems/database consulting and custom software development.

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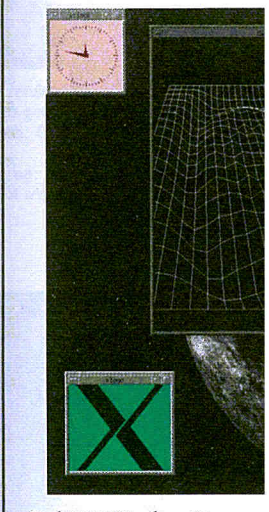
Bridge the Gap



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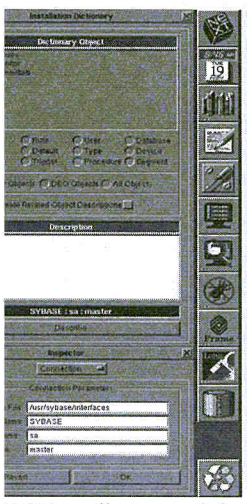

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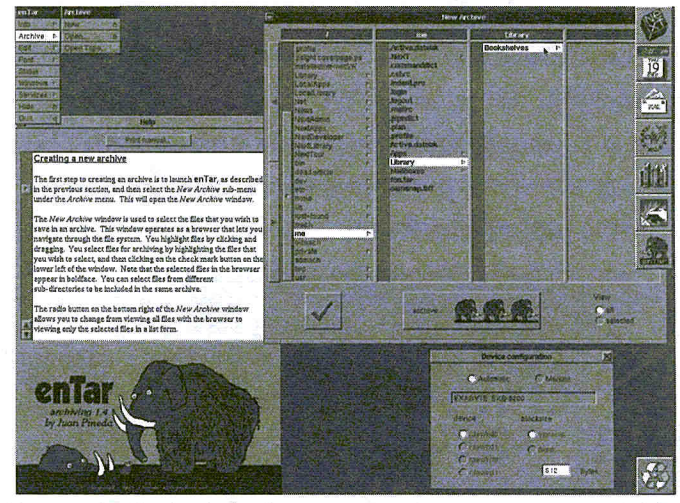

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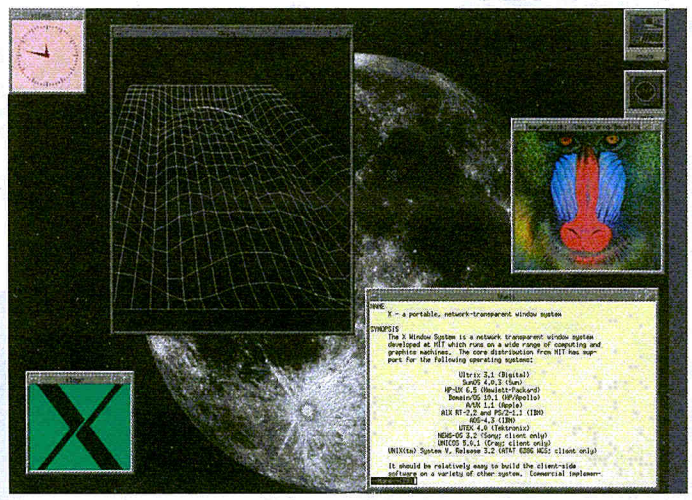

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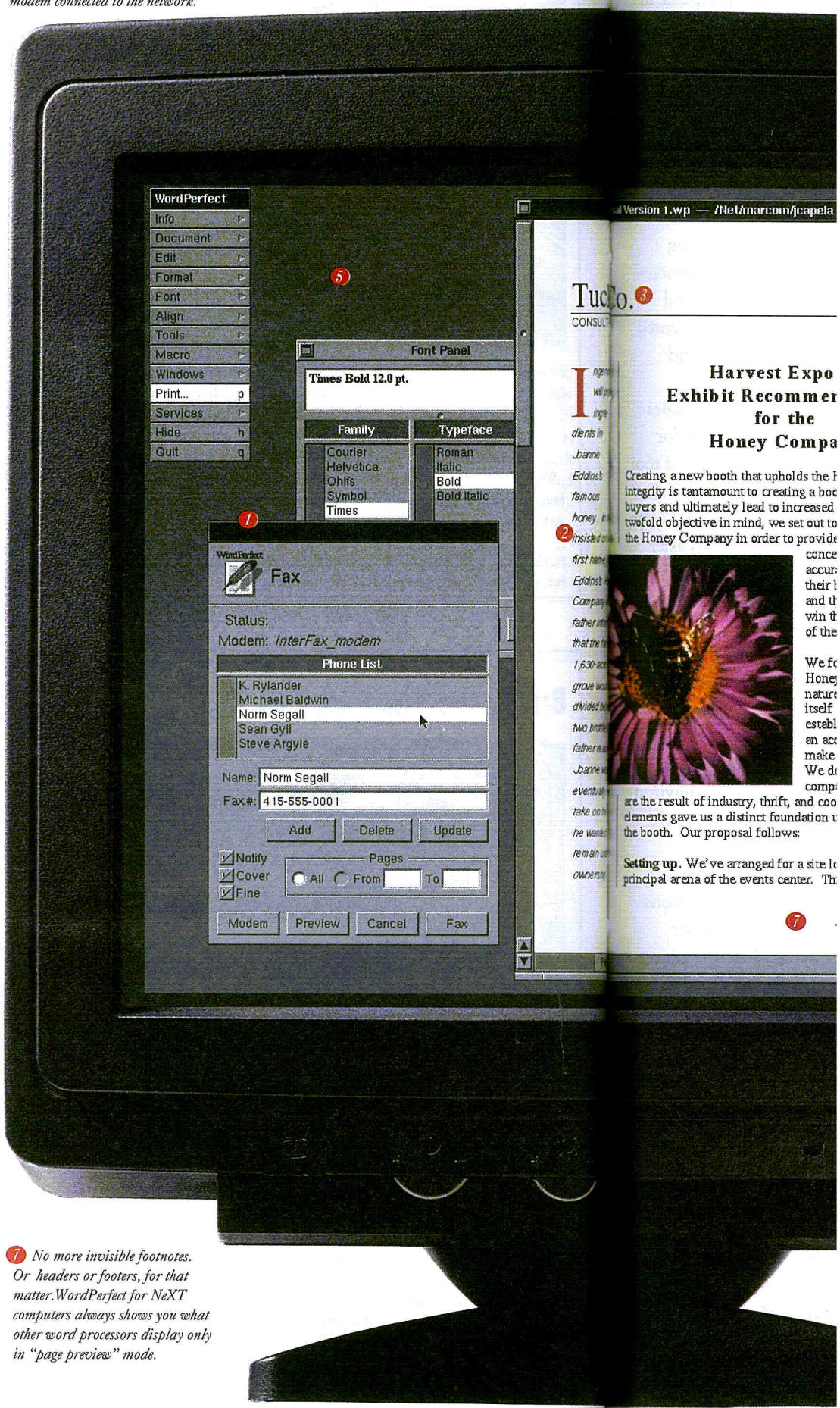
If you'd like more information, just call WordPerfect at (801) 225-5000. We think you'll agree that WordPerfect and NeXT computers represent another leap in word processing. Then again, from what we've seen in the world of NeXT, innovation seems to be the order of the day. WordPerfect®

1 *Fax capability is built into every NeXT computer. So you can easily send a document directly from your screen to any fax machine on earth at 200 dpi resolution. All you need is a single fax-modem connected to the network.*

2 *Creating columns doesn't require any gymnastics. Just say how many you want and there they are–all easily adjustable for varying widths.*

3 *NeXT machines use Display PostScript to generate the screen image, so fonts are always sharp no matter what the type size or degree of rotation.*

5 *In the NeXT world, the "Dock" is where you park your most frequently used applications. With true multitasking, you can use all of them at once–cutting and pasting as much as you want.*



7 *No more invisible footnotes. Or headers or footers, for that matter. WordPerfect for NeXT computers always shows you what other word processors display only in "page preview" mode.*

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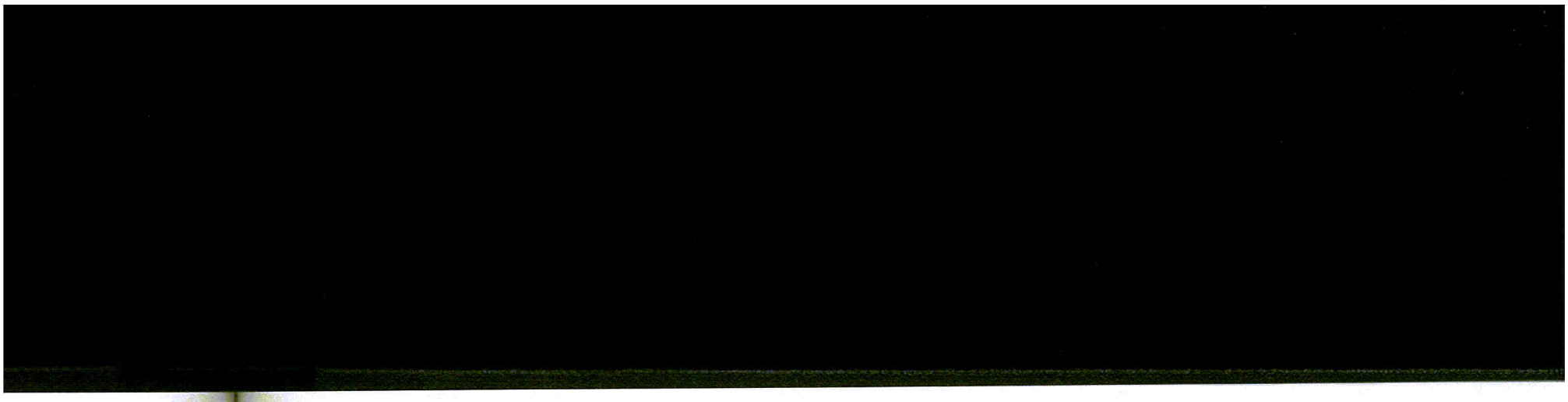

3 *NeXT machines use Display PostScript to generate the screen image, so fonts are always sharp–no matter what the type size or degree of rotation.*

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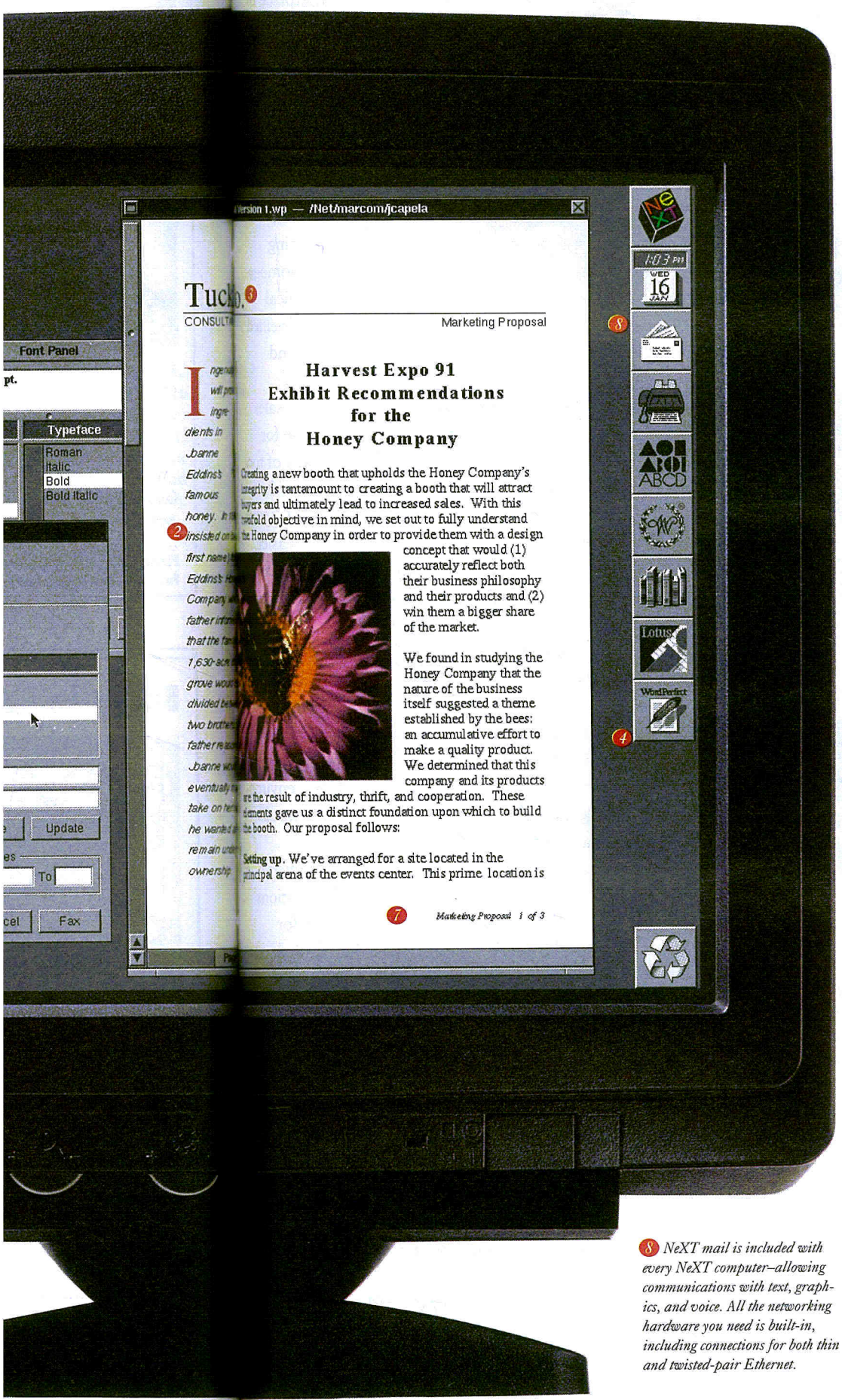

8 *NeXT mail is included with every NeXT computer–allowing communications with text, graphics, and voice. All the networking hardware you need is built-in, including connections for both thin and twisted-pair Ethernet.*

As WordPerfect discovered, there is one machine perfect for WYSIWYG word processing: the NeXTstation™ computer.

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And with Display PostScript® on the ultra-high-resolution MegaPixel Display,™ images are rich in detail and paper-crisp. Type remains sharp, no matter what the point size or degree of rotation.

NeXT machines also offer true multitasking, so all your work can flow more smoothly. When creating a document, for example, you can receive an image via NeXTmail,™ drag it onto your WordPerfect page, then (using the network fax modem) send the finished document directly from your screen to any fax machine on earth.

As the first computer built to exploit Motorola's revolutionary 68040 chip, the NeXTstation delivers performance that's truly inspiring. And with a price starting at $4995, *Byte Magazine* says it "may now be the industry price/performance leader."

No argument here. Considering this one price includes the display, the keyboard, 8 MB of memory, a 2.88 MB floppy disk drive, a 105 MB hard disk, and both twisted-pair and thin Ethernet. Not to mention NeXTmail—which lets you communicate using text, graphics, and even your voice.

Call 1-800-848-NeXT for our NeXTstation brochure. It marks a new era in computer literature: What You See Is What You Want.

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Open Horizons

BRUCE F. WEBSTER

Despite modest successes, NeXT has failed to convince major software publishers to support its platform. Beyond the size of the market, there's another problem. It is unnecessarily difficult to port NeXTSTEP applications to other platforms.

The Problem: Software publishers need to go cross-platform. With flat earnings and savage price competition, firms are looking for ways to speed development and broaden market penetration. Also, end users are moving rapidly towards mixed hardware and software installations and client-server architecture.

Hardware and operating-system vendors are starting to realize the challenges faced by the developers who help sell their products. Apple is forming a joint venture with Symantec to create the Bedrock development environment, intended to allow parallel development for Macintosh, Windows, and other environments. Rumors have surfaced about Microsoft doing much the same thing.

Sitting somewhere on the sidelines is NeXT, offering one of the best development environments around – but on proprietary hardware running proprietary software and using development tools not readily available elsewhere. The hardware issue should start to fade by year's end, with the introduction of NeXTSTEP '486. The software issue, while real, is also NeXT's big advantage, especially with the sudden opening of the 32-bit OS market. NeXT stands a good chance of exceeding anyone's expectations as far as acceptance and market penetration in 1993. This is good news for developers who have stuck with NeXT, but for all but the smallest and most dedicated firms, it's not good enough.

The irony is that one of NeXTSTEP's biggest advantages – use of Objective-C and supporting tools – also serves as a major roadblock. The rest of the world has gone chasing after C++ and has only slowly discovered its limitations for object-oriented design, particularly with regards to dynamic binding. On the other hand, developers using Objective-C on the NeXT run into problems when they want to move to other environments. These barriers, real and perceived, have caused many developers to avoid NeXTSTEP development in the first place.

The Proposal: NeXT does not need to seek a general solution for developers – just lower the barriers. Most NeXTSTEP developers would eagerly accept the following collection of tools for each environment supported: the same Objective-C compiler as provided with NeXTSTEP 3.0; an appropriate run-time system; a compatible version of **gdb** (the source-level debugger); and a compatible implementation of the Object root class and some key (non-UI) subclasses, primarily for support of distributed and linked objects. (Note what is not included: any attempt to reproduce the NeXTSTEP user interface classes from the AppKit.) The order of environments would probably start with Windows NT.

The effort involved should not be great. The fact that most of the tools are directly based on the Free Software Foundation's public domain GNU software simplifies things greatly.

The Objections: This idea is not a new one. It's not hard to guess why NeXT hasn't acted on it. NeXT is afraid that such a move will benefit its competitors and cause it to lose sales. NeXT also thinks that all its developers want and need is a larger NeXTSTEP installed base. But this is blind, zero-sum thinking and ignores the dramatic shift within the marketplace in the last year or two. It illustrates why NeXT has had problems holding on to developers or gaining new ones: NeXT thinks that what is desirable for NeXT is good for its developers, instead of the other way around.

The Reasons: On the flip side, there are compelling reasons – based on NeXT's own strategy – for NeXT to actively pursue such an effort.

Support distributed architecture. Throughout 1992, NeXT has been promoting various concepts of distributed-software architecture, including object links and client-server design. At the same time, NeXT has been actively increasing its network and file-system connectivity, recognizing that few computing environments are homogeneous anymore. Given this, the next logical step is to support a distributed, object-oriented software architecture across platforms and operating systems.

Attract and keep developers. NeXT sales to date have not made a compelling case for NeXTSTEP-only development, and lack of tool compatibility has kept away developers who might otherwise take a chance on NeXT. Given the tools described above, it will be far easier for software companies to justify starting or continuing NeXTSTEP development than it is now. In fact, there would be a much greater chance of back-room or trial-development projects starting up in companies that might otherwise not attempt NeXTSTEP development. Such companies would still have to deal with issues of memory management, imaging, user interface, and system services for other environments, which means that the NeXTSTEP versions of their product would tend to come out sooner and have better functionality.

Attract and keep customers. Potential and current NeXT customers want to be able to run similar versions of key shrinkwrapped applications on all platforms. They may want to write new custom applications for other environments – or adapt existing ones – to exchange data and objects with their mission-critical applications running under NeXTSTEP.

Showcase NeXTSTEP's advantages. This is an extension of the Trojan-horse strategy NeXT is counting on. Even with these tools available, NeXTSTEP would still retain its key advantages for shrinkwrapped and mission-critical-application development. Thus, as developers and customers adopt or experiment with NeXTSTEP because of the cross-platform potential, it will quickly become the preferred development and deployment environment, subverting from within.

The Plea: Come on, NeXT. Take off your blinders and leapfrog current thinking. Your developers will bless you. Your customers will love you. And you just might succeed beyond even your expectations.

BRUCE F. WEBSTER *is chief technical officer at Pages Software and also president of the Association of NeXTSTEP Developers International (ANDI). He can be reached at bwebster@pages.com.*

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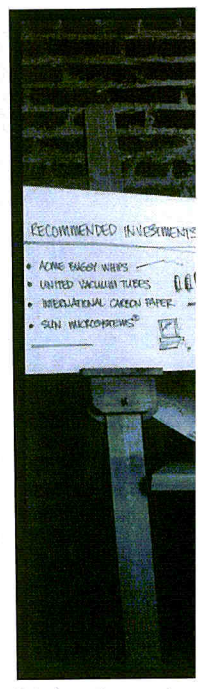

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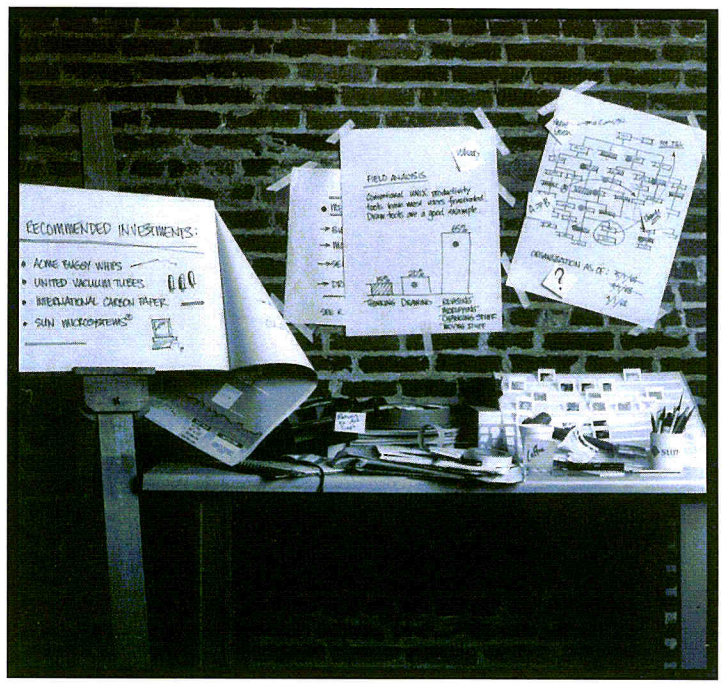

Workstation productivity circa 1980

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NeXTWORLD

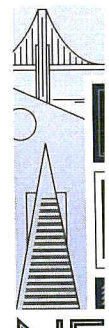
Expo rallies N for a big year

by DAN LAVIN

San Francisco – Today's openin of *NeXTWORLD* Expo marks the first international gathering of users, dealers and distributor and third-party developers that make up the burgeoning NeXT market.

Thousands of attendees from all states and numerous foreign countries – some from as far away as Russia, France, and Australia – will first hear NeXT CEO Steve Jobs's keynote address introducing a barrage of much-anticipated new products. Then they will choose from over 40 conference sessions and browse the wares of exhibitors.

For some, the Expo represe a Woodstock of computerdom.



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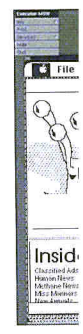
Abacus ships

by DAN LAVIN

Albuquerque, NM – NeXT use can now run Macintosh softwa in a NeXT window, thanks to the Executor-MSW software emulator from Abacus Researc and Development (ARDI). The $80 product was officially released in late December and is being demonstrated at this week's Expo.

This current release is guaranteed to run only Microsoft Word for the Macintosh Version 4.00d on the NeXT, although the software will import any Macintosh program and attempt to



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